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L5: Entry 1 of 3 File: USPT Sep 24, 2002

DOCUMENT-IDENTIFIER: US 6455068 B1
TITLE: Dietary fiber delivery system

Abstract Text (1):
A delivery system and method for delivering soluble dietary fibers in a chewable tablet form which is palatable and demonstrates a high degree of consumer acceptability.

Brief Summary Text (3):
The present invention relates generally to a delivery system for dietary fibers and more particularly to a delivery system for soluble dietary fiber supplements preferably in the form of a safe, chewable tablet, lozenge, wafer, cookie or the like which is comprised in part of a relatively low viscosity, non-gelling and organoleptically pleasing dietary fiber component.

Brief Summary Text (5):
Unlike other nutrients, dietary fiber is not a single substance, but is a term used to identify plant polysaccharides and lignins that are not hydrolyzed by the endogenous secretions of the human digestive system. Thus, they reach the colon intact. Plant components which make up dietary fiber include, among others: structural polysaccharides (cellulose and hemicellulose), nonstructural polysaccharides (pectines, B-glucans, gums and mucilages) and structural nonpolysaccharides (lignin). Dietary fibers are commonly characterized by their water solubility and their relative susceptibility to microbial degradation into fermentable and nonfermentable fiber fractions. In general, pectines, gums and mucilages are water soluble, while lignin, cellulose and hemicellulose are water insoluble.

Brief Summary Text (6):
Dietary fibers by definition reach the colon intact and thus generally escape digestion and absorption in the small intestines; however, such fibers are susceptible to varying degrees of microbial fermentation or degradation in the colon. Such degradation results in the production of carbon dioxide, hydrogen, methane, and various short chain fatty acids.

Brief Summary Text (7):
For much of the twentieth century the common notion among clinicians and nutritionists was that fiber was roughage or the like comprised of indigestible cell walls. Except for providing bulk for normal bowel function, such fiber was considered to be of no nutritional value. Accordingly, many food scientists directed their efforts toward enhancing the purity of food by removing dietary fiber.

Brief Summary Text (8):
However, during the last few decades, stimulated principally by epidemiological observations revealing differences in disease patterns between populations, researchers began to accumulated a large body of evidence linking a low fiber western diet with the incidence of numerous chronic diseases. Numerous laboratory and clinical investigations have also confirmed various risk factors associated with low fiber diets and the protective nature of high fiber diets.

Brief Summary Text (9):
The association of high dietary fiber intake with lower risk or improvement in several chronic diseases has led to recommendations to increase dietary fiber consumption to 20-35 grams per day. Because of these recommendations and the mounting recognition of health benefits of high fiber diets, health care professionals have aggressively attempted to encourage individuals to consume high

fiber diets that are rich in fruits, vegetables, legumes and whole grains. Regrettably, many of the most popular foods, and particularly those most popular in western diets, are low in dietary fiber. Thus, for those consuming an affluent "refined western diet", satisfying these recommendations is a difficult task. Accordingly, despite the recommendations advocating high fiber diets, the intake of dietary fiber has not significantly increased. Recent consumption surveys reveal that average dietary intake of fiber remains at approximately 10-12 grams per day.

Brief Summary Text (10):
As a result, a variety of dietary fiber supplements have been marketed for increasing the consumption of dietary fiber. Unfortunately, however, such supplements have achieved limited consumer acceptance. Much of the dissatisfaction arises because of the physical organoleptic and other characteristics of the fiber components which make up the great majority of dietary fiber supplements currently available. Common dietary fiber supplements are comprised of fiber components such as psyllium (sold under the trademark Metamucil or Fiberall), methylcellulose (sold under the trademark Citrucel) and polycarbophil or calcium polycarbophil (sold under the trademark Fiber Con). These generally have a significant affinity for water. Thus, when exposed to water or other fluids prior to or during ingestion, or when progressing through the digestive system, these components tend to swell quickly and produce highly viscous fluids and gels. For instance, when hydrated, psyllium fiber produces an unacceptably gummy, chewy product. This has led directly to increased safety risk such as choking, obstruction and the like, both during and after ingestion. In fact, scientific literature has reported obstructions (esophageal and small bowel) requiring medical attention from the consumption of both insoluble and soluble fiber supplements.

Brief Summary Text (11):
To minimize this problem, it is recommended that present fiber supplements be ingested while consuming a large quantity of liquids (a minimum of eight ounces of fluid) or that smaller quantities of the supplement be ingested. In fact, the FDA's Tentative Final Monograph for Laxatives specifies that a full glass (8 ounces) of liquid be taken with each dose of certain fiber supplements. Typically, dietary fiber supplements are ingested in the form of swallowable tablets, reconstitutable powders or wafers. Swallowable tablets, because of the above safety concerns, are limited to tablets of one gram or less and more typically 0.5 grams or less. This, however, leads to two areas of consumer dissatisfaction: the need to ingest a large amount of liquid per dose as well the need for a large number of doses to get a meaningful amount of fiber.

Brief Summary Text (12):
Fiber supplements in the form of a reconstitutable powder have also met with limited consumer acceptance due principally to mouth feel of the product (the texture and grittiness), gelling due to viscosity buildup, visual appearance, the relatively large amounts of liquid required for mixing and consumption and limited palatability. The inconvenience of reconstituting and ingesting the product outside the home and the necessity for cleanup also encumbers lifestyle and results in poor compliance. As an alternative, fibers supplements are often offered as wafers or as swallowable tablets as described above.

Brief Summary Text (13):
To overcome some of the problems identified above, the prior art teaches the encapsulation or pre-coating of dietary fiber supplements delivered as swallowable tablets. Although this somewhat improves certain of the organoleptic properties by masking undesirable flavors and texture and delays hydration until it passes through the oral cavity, the limitations resulting from the relatively small swallowable tablets continue to exist. The prior art also describes attempts to mask the fibrous mouth feel of current fiber supplements by concealing the dietary fiber in wafers, baked goods, granola-type products, power bars, cookies, cereals and snack foods. While this technology has achieved some degree of success, it often requires the inclusion of ingredients high in fat, carbohydrates and calories and low in dietary fiber. Thus, consumers wishing to restrict their caloric intake are often reluctant to utilize such products. Further, the level of dietary fiber that can be incorporated into other foods without adversely affecting the taste and mouth feel is quite limited. In general, the upper limit is about 5% by weight.

Brief Summary Text (14):
Still further, the prior art teaches the use of fine powders of dietary fibers, excipient and or dispersing agents to reduce the formation of fibrous clumps or "fish eyes" during rehydration. In comparison to coarser powders, the fine powders of dietary fibers tend to be less gritty upon reconstitution.

Brief Summary Text (15):
According, there is a need for a dietary fiber supplement which addresses the problems in the prior art and provides a dietary fiber supplement and a delivery system for a dietary fiber which does not pose safety concerns resulting from viscosity buildup or gelling and which is palatable, aesthetically pleasing and exhibits characteristics which enable it to be delivered as a chewable tablet or lozenge without the choking, obstruction or other safety concerns.

Brief Summary Text (17):
In contrast to the prior art, the present invention provides a dietary fiber supplement, and more particularly, a dietary fiber supplement delivery system which enables relatively large doses of fiber to be ingested with dissolution and substantial hydration in the oral cavity without experiencing safety concerns and while providing a palatable and organoleptically pleasing product. More specifically, the present invention relates to the discovery of a subset of soluble dietary fibers which do not significantly increase in viscosity or gel when exposed to water or other liquids, yet possess the desirable organoleptic characteristics and the ability to function as a dietary fiber. This particular subset of soluble dietary fibers exhibits characteristics which enable the same to be delivered as a chewable tablet, wafer or lozenge having excellent texture, mouth feel and palatability and which can be delivered without experiencing the choking, obstruction or other safety concerns commonly associated with dietary fiber supplements currently existing in the art. The dietary fiber supplement of the present invention is designed to be chewed or dissolved slowly and then swallowed without experiencing such safety concerns or unpleasant organoleptic or other properties.

Brief Summary Text (18):
Further, the dietary fiber supplement of the present invention is organoleptically pleasing and does not require the addition of masking agents or coating techniques to improve its taste and mouth feel. Further, it does not require delaying hydration until it passes out of the oral cavity as is required with some present supplements. Accordingly, this subset of materials results in improved consumer acceptance and compliance. This in turn encourages and enables the long term consumption of fiber supplements for those individuals who will benefit from such increase in fiber intake.

Brief Summary Text (19):
Preferably the dietary fiber supplement in accordance with the present invention is comprised of a subset or category of fiber supplements which, when exposed to water or other fluid, do not result in significant buildup of viscosity or gelling. These fiber components are sometimes referred to herein as "non-gelling low viscosity fiber components" or simply as "low viscosity fiber components". More specifically, the category of materials that are applicable to the present invention are those materials which when exposed to water or other liquid result in a solution which does not gel and exhibits a viscosity significantly less than the viscosity of similar solutions of currently available dietary fiber supplements. Such materials also preferably exhibit organoleptically pleasing properties and palatability. Although a variety of dietary fiber components may exhibit these properties, the preferred embodiment contemplates a dietary fiber component comprised of inulin or fructooligosacchaides (FOS) either individually or in combination. In accordance with the present invention, such component is delivered in a chewable form as a chewable tablet, lozenge, wafer, cookie or the like (hereinafter referred to as a "chewable tablet") ranging in size from one-half gram to as much as ten grams. Preferably the chewable tablet comprises at least 10% by weight of the dietary fiber component, more preferably, at least 30% by weight and most preferably at least 50% by weight.

Brief Summary Text (20):
The present invention also relates to a dietary fiber delivery method for a human subject which involves preparing a chewable tablet or wafer of the type described above and then chewing and swallowing the tablet. This may be accomplished with or without water.

Brief Summary Text (21):
Most significantly, the present invention provides a delivery system for fiber supplementation in a chewable form which can deliver large quantities of fiber, particularly in the range of 3-5 grams, in a single chewable tablet which unexpectedly is quite palatable and demonstrates a high degree of consumer acceptability. Notwithstanding the size of the chewable tablet or wafer, it provides a pleasing mouth feel which dissolves rapidly due to the presence of the soluble fiber used in this invention. The present invention thus avoids the unpleasant gritty or gummy textures associated with chewable fiber supplements of the prior art.

Brief Summary Text (22):
Accordingly, it is an object of the present invention to provide a novel, safe, advantageous, user friendly, convenient, highly acceptable mechanism for the delivery of dietary fibers in a form and in quantities previously unavailable.

Brief Summary Text (23):
Another object is to provide a chewable delivery system comprised of one or more soluble dietary fibers which are to be masticated (or slowly dissolved) in the oral cavity with substantial hydration and swallowed upon complete disintegration without experiencing the safety concerns and unpleasant organoleptic properties of presently available fiber supplements.

Brief Summary Text (24):
Another object of the present invention is to provide a chewable tablet for the administration of physiologically active soluble fibers or resistant starches while avoiding the safety concerns and other consumer disadvantages associated with such fibers.

Brief Summary Text (25):
Another object of the present invention is to provide a delivery system for a dietary fiber supplement which does not gel and which encourages long-term compliance and consumption.

Brief Summary Text (26):
A still further object of the present invention is to provide a dietary fiber supplement in a form which exhibits a relatively low viscosity when exposed to water or other liquids.

Brief Summary Text (29):
Because of the association between high dietary fiber intake and improved health benefits, the general consensus and recommendations from health care professionals is to increase the consumption of dietary fiber. Because many diets, and in particular affluent western diets,. fail to provide sufficient fiber intake, fiber supplements are highly recommended. Depending upon the particular individual's medical and health status and diet, it is anticipated that the adult daily fiber supplement could range from 1-20 grams and more probably from 3-15 grams. Presently available fiber supplements are generally administered from 1-6 times per day in unit dosages of 0.5-3 grams.

Brief Summary Text (30):
In accordance with the present invention, a dietary fiber supplement delivery system is provided in which dramatically increased quantities of fiber supplements can be administered and ingested without danger of choking, internal obstruction or other safety concerns. Preferably, the system includes a chewable tablet comprised principally of a low viscosity dietary fiber component which when exposed to water or other liquid exhibits a relatively low viscosity (hereinafter sometimes referred to as "low viscosity fiber component"), but which still functions as a dietary fiber and provides highly desirable organoleptic and other properties.

Brief Summary Text (31):
The low viscosity fiber components useful in the present invention are those dietary fiber components which exhibit relatively low viscosity buildup when exposed to water or other fluids. More specifically, the dietary fiber components exhibiting the reduced viscosity property of the present invention are those fiber components which when combined with water to form a 10% by weight solution of the component exhibit a viscosity at 25.degree. C. which is preferably less than 100 centipoise (cps), more preferably less than 25 cps and most preferably less than 5 cps.

Brief Summary Text (32):
Although it is contemplated that a variety of fiber components would meet this low viscosity requirement, the preferred embodiment contemplates that such component would be either inulin or a fructooligosaccharide (FOS). Inulin or FOS can be provided either individually or in combination and is preferably delivered as a chewable tablet. It can also be provided as a powder to be reconstituted with water, if desired. Inulin is comprised of fructofuranose polymers (oligomer and polymers of fructose) of varying chain lengths with a DP (degree of polymerization) ranging from 2 to 60 monomeric fructose units linked to a terminal glucose molecule. More preferably, inulin of the present invention has a DP of 2-20 and mostly preferably a DP of less than 10. FOS is a mixture of the smaller fructan polymer fractions with a DP of 2 to 8. Thus, the molecules of FOS have 2 to 8 fructose units linked to a terminal glucose molecule. FOS can be commercially produced by the partial enzymatic hydrolysis of inulin or enzymatically synthesized from sucrose. Inulin or FOS offer functional physical and organoleptic advantages over other nondigestible polysaccharides which make up what are currently considered as dietary fibers or resistant starches. These functional, organoleptic and aesthetic properties provide significant advantages to the present invention which do not exist with respect to present dietary fiber supplements. In contrast to currently available fiber supplements, inulin and FOS comprise relatively small polymers which at anticipated levels of fiber do not build viscosity, swell or gel. Additionally, inulin and FOS are slightly sweet and have a pleasing taste and texture.

Brief Summary Text (34):
The non-gelling and reduced viscosity property of the inulin, FOS and other dietary fiber components applicable to the present invention is to some extent directly related to the molecule size and thus the molecular weight of the particular polysaccharide. Inulin is a mixture of fructose polymers of varying chain lengths ranging from 2 to 60 monomers with a molecular weight of less than 11,000 and with a typical molecular weight of about 5,000. Fructooligosaccharides with chain lengths ranging from 2 to 8 fructose monomers have a molecular weight of less than about 1,500. The molecular weight of currently available dietary fibers typically exceed 100,000. For example, the molecular weight of guar is greater than 200,000, the molecular weight of tragacanth exceeds 800,000, and the molecular weight of pectin ranges from 40,000 to 400,000. The molecular weight of the low viscosity fiber component molecules in accordance with the present invention is preferably less than 40,000, more preferably less than 25,000 and most preferably less than about 5,000.

Brief Summary Text (35):
During hydration, a gram of either inulin or FOS binds less than two grams of water. In contrast, conventional dietary fiber components bind significant quantities of water. For example, one gram of xanthin will bind approximately 18.5 grams of water, one gram of carrageenan will bind approximately 32.9 grams of water, one gram of guar will bind approximately 24.9 grams of water, one gram of pectin will bind between 5 to 56.2 grams of water and one gram of karaya will bind approximately 12.5 grams of water. Accordingly, the water binding property of the low viscosity fiber component in accordance with the present invention is that one gram of the fiber component will preferably bind less than 10 grams of water, more preferably less than 5 grams of water and most preferable less than 3 grams of water.

Brief Summary Text (36):
Both the molecular weight property and the water absorbing capacity of a dietary fiber component are further related to the ability of that component to form a viscous solution when exposed to water. Typically, a 2% by weight H.sub.2 O solution of tragacanth exhibits a viscosity of approximately 1,000 cps, a 2% by weight

H.sub.2 O solution of guar exhibits viscosity of about 25,000 cps, a 2% by weight H.sub.2 O solution of karaya exhibits a viscosity of approximately 8,000 cps and a 2% by weight H.sub.2 O solution of xanthin exhibits a viscosity of about 4,000 cps. In comparison, even a 10% by weight H.sub.2 O solution of inulin and FOS exhibit relatively low viscosities on the order of about 2 cps. This is to be further compared with 10% by weight H.sub.2 O solutions of native dietary fiber such as gum arabic, which exhibits a viscosity of about 20 cps, and arabinogalactan, which exhibits a viscosity of about 3 cps. Although arabic is a relatively large molecule with a molecular weight of up to 600,000, it is a globular rather than a linear molecule which resists hydration and thus exhibits a relatively low viscosity. The low viscosity fiber component in accordance with the present invention preferably comprises a component which when combined with water to form a 10% by weight H.sub.2 O solution of such component exhibits a viscosity at 25.degree. C. of preferably less than 100, more preferably less than 25, and most preferably less than 5 cps.

Brief Summary Text (37):
The discussion of the preferred embodiment has been with respect to inulin and FOS which exhibit the desired properties of reduced viscosity in their natural, unprocessed form. However, the present invention also contemplates that various existing high molecular weight, nondigestible polysaccharides currently available as dietary fiber supplements may be processed to reduce their viscosity, gelling and other undesirable properties, and thus function in accordance with the present invention. Two examples are guar and various resistant starches.

Brief Summary Text (38):
Guar is a high molecular weight polysaccharide which at low concentrations forms viscous solution and gels. Prior art has shown, however, that through controlled hydrolysis, the average molecular weight of guar can be significantly reduced. This reduction in polymer size can significantly alter it viscosity building and gelling characteristics. For example, it is known that Taiyo Kagaku Co., Ltd produces a hydrolyzed guar through controlled enzymatic hydrolysis which produces an average molecular weight guar approximately one tenth that of the starting material. This hydrolysis improves the organoleptic properties of the resulting material and significantly reduces the viscosity and gelling characteristics. The viscosity of a solution of this hydrolyzed guar may be as much as 2,000 times or more lower than a similar solution of the native guar. Accordingly, it is contemplated that the low viscosity fiber component of the present invention, in addition to comprising inulin or FOS, may also comprise nondigestible polysaccharides which have been hydrolyzed or otherwise processed to reduce the viscosity of a solution of such material in accordance with the levels specified above.

Brief Summary Text (39):
Starch is a plant's storage form for glucose. Native dietary starch is a complex carbohydrate consisting of either straight (amylose: alpha-1,4 glucosidic bonds) or branched (amylopectin: alpha-1,4 and alpha-1,6 glucosidic bonds) chain monomers of glucose. For most of these complex polysaccharides, enzymatic hydrolysis occurs in the mouth, stomach and small intestines when ingested. Resistant starch is that fraction of dietary starch that escapes hydrolysis and enters the colon where it is subject to fermentation by the colonic flora. Accordingly, resistant starches are polysaccharides which are not digested by the human enzymes within the oral cavity and the gastrointestinal tract and thus are considered to be dietary fiber. Accordingly, it is contemplated that the non-gelling and low viscosity fiber component in accordance with the present invention may comprise resistant starches to the extent that the viscosity and other requirements described above are met.

Brief Summary Text (40):
Accordingly, the principle component of the dietary fiber supplement in accordance with the present invention is a non-gelling, low viscosity fiber component most commonly comprising a polysaccharide or complex carbohydrate exhibiting the properties described above.

Brief Summary Text (41):
One of the novel delivery forms of such low viscosity fiber component is in a chewable form such as a chewable tablet which is capable of delivering supplemental quantities of dietary fibers from 0.5 to as much as 6.0 grams or more per dose.

Preferably, the chewable tablet in accordance with the present invention is greater than 0.5 grams, more preferably greater than one gram and most preferably greater than two grams.

Brief Summary Text (42):
The manufacture of chewable tablets in accordance with the present invention utilizes tableting procedures and practices commonly known in the art and employed to produce tablets. Accordingly, the process of producing the chewable tablets in accordance with the present invention follows procedures known in the art. Further, except for the selection of the appropriate low viscosity fiber component, the formulation may be widely varied to attain the product attributes (flavor, aroma, color, texture and physical characteristics) and provide for appropriate and desired delivery of nutrients.

Brief Summary Text (43):
In general, the chewable tablet in accordance with the present invention is prepared by the dry blending of the desired ingredients to assure homogeneity in an appropriate blender (V, ribbon, paddle or plow), followed by compressing the mixture into a tablet possessing the preferred physical characteristics. To insure a final tablet of proper chewable consistency and/or facilitate tablet dissolution, etc., excipients such as microcrystalline cellulose, sugar alcohol (sorbitol, mannitol, xylitol) and sugars (glucose, fructose, sucrose) may be added either individually or in combination in any desired ratio. Further, to increase the nutritional value of the chewable tablet, the addition of various vitamins and/or minerals or combinations thereof may be included. These additives can increase the utility of the fiber supplement and be a particularly convenient mechanism for addressing a particular individual's nutritional needs. Still, further, to assure taste acceptability of the tablet, flavor additives, either individually or in combination, may be included. To improve the aesthetics of the tablets, the inclusion of coloring agents in any desired ratio may be used. Lubricants/release agents such as stearic acid, magnesium stearate or polyethylene glycol may also be included either individually or in combination to facilitate tablet ejection from the mold.

Brief Summary Text (44):
The tablet of the present invention can also include calcium so as to achieve the known benefits of the combination of calcium and dietary fiber.

Brief Summary Text (45):
Although it is contemplated that the chewable tablet in accordance with the present invention can be comprised almost exclusively (i.e. up to 99% or 100%) of the low viscosity fiber component, it is more likely that one or more of the above or other additives may be included to meet a particular nutritional, organoleptic or other goal. Accordingly, it is contemplated that the chewable tablet in accordance with the present invention will be comprised of at least about 10% by weight of the low viscosity component. More preferably, the chewable tablet is intended to comprise at least 30% by weight up. to at least 50% by weight of the low viscosity component. Most preferably, the tablet comprises 30% to 60% by weight of the low viscosity fiber component.

Brief Summary Text (47):
In addition to providing the low viscosity fiber component as a chewable tablet, it is also contemplated that the low viscosity fiber component may be administered in powder form to be added with water or other fluid and reconstituted prior to ingestion.

Brief Summary Text (48):
Having described the details of the low viscosity fiber component and its administration in the form of a chewable tablet, the following examples demonstrate the present invention. All ingredient percentages refer to a measurement by weight.

Detailed Description Text (2):
Chewable Dietary Fiber Supplement

Detailed Description Text (4):

Ingredients are dry mixed in an appropriate blender (V, ribbon, paddle, and plow) to assure homogeneity of the batch and then compressed into tablets. This mixture when compressed into tablets had a pleasant, slightly sweet taste. The chewiness which is a function of the rate of hydration in the oral cavity can be somewhat controlled by the compression pressure. The shape, size, and weight of the tablet will vary to reflect the desired amount of fiber to be delivered. Above 10 grams the size may become overwhelming and the preferred shape may be cubular for these supplements with such large quantities of dietary fibers.

Detailed Description Text (8):
Ingredients are dry mixed in an appropriate blender (V, ribbon, paddle, and plow) to assure homogeneity of the batch and then compressed into tablets of appropriate size for the deliver of desired quantity of dietary fiber. A 5.055 gram tablet has been found to be a particularity pleasant way of delivering 3 grams of inulin.

Detailed Description Text (12):
Ingredients are dry mixed in an appropriate blender (V, ribbon, paddle, and plow) to assure homogeneity of the batch and then compressed into tablets of appropriate size for the delivery of desired quantity of dietary fiber.

Detailed Description Text (16):
Ingredients are dry mixed in an appropriate blender (V, ribbon, paddle, and plow) to assure homogeneity of the batch and then compressed into tablets of appropriate size for the delivery of desired quantity of dietary fiber.

Detailed Description Text (19):
The inclusion of vitamins and/or minerals either singly or in combination as a value added feature for chewable fiber tablets as a delivery systems for soluble dietary fiber or resistant starches. The tablets were prepared in the manner described above. The following example demonstrates a sugar-free, nutrient fortified chewable tablet.

Detailed Description Text (23):
Chewable tablets as a delivery system were prepared in the manner described above. The following example demonstrates a sugar free chewable fiber tablet with the inclusion of a Calcium.

Detailed Description Text (27):
The therapeutic value of the chewable fiber to the user tablet can be improved by the inclusion of biologics. Chewable fiber tablets as a delivery systems for bovine immunoglobulins were prepared in the manner described above. The following example demonstrates one such chewable tablet.

Detailed Description Text (29):
The chewable dietary fiber supplement can be used to deliver specific bovine antibodies to control the microbial flora in the oral cavity, stomach, small intestines, and colon. As such a chewable dietary fiber tablet with added bovine immunologlobulin can be used to reduce the occurrence of certain health concerns associated with microbial growth or as the therapy to treat these concerns.

Detailed Description Text (30):
The inclusion of other biologics is also contemplated. The chewable dietary fiber supplement provides a logical delivery system for a probiotic microbial mixture. The fermentable dietary fibers act as an enhancer of the probiotics cultures.

US Reference Patent Number (31):
5476678

US Reference Group (31):
5476678 19951200 Walter et al.

Other Reference Publication (23):
"The Dark Side of Fiber" Geriatric Nursing 1991; Jan./Feb.: 43.

Other Reference Publication (44):

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Other Reference Publication (45):
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Other Reference Publication (49):
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Other Reference Publication (51):
High-Fibre Problem, The Practioner, Mar. 8, 1990, pp. 206.

Other Reference Publication (53):
Health Benefits and Practical Assets of High-Fiber Diets, Anderson et al., AM J Clin Nutr, 1994; 59 (Supplement) pp. 1242s-1247s.

Other Reference Publication (54):
Dietary Fiber and Health, JAMA, Jul. 28, 1989, vol. 262, No. 4, pp. 542-546.

CLAIMS:

1. A chewable dietary fiber tablet or wager comprising, as a source of dietary fiber, a water-soluble, on-gelling inulin having a degree of polymerization of between 2 to 20, wherein the inulin is present in an amount of at least 50% by weight of the tablet or wafer, and wherein the inulin, when combined with water to form a 10% by weight solution, has a viscosity at 25.degree. C. of less than 100 centipoise.

2. The chewable dietary fiber tablet or wafer of claim 1, wherein the non-gelling inulin has a degree of polymerization of less than 10.

3. The chewable dietary fiber tablet or wafer of claim 1, wherein the non-gelling inulin solution has a viscosity at 25.degree. C. of less than 25 centipoise.

4. The chewable dietary fiber tablet or wafer of claim 1, wherein the non-gelling inulin solution has a viscosity at 25.degree. C. of less than 5 centipoise.

initial ratio of HDL-C to FSTC was low, then **supplementation** did not decrease FSTC to the extent observed when the initial ratio was high. Compliance with the **dietary** interventions was best when the subjects gave the product a rating of ltoreq2.0 (on a 1-4 hedonic scale, with 1 being excellent). We can conclude from these data that **fiber supplementation** to reduce serum cholesterol is most effective in hypercholesterolemic individuals that have a greater proportion of HDL-C. In addition, not all the oat **bran** products evaluated were able to lower cholesterol to the same extent, indicating that the ability of soluble **fiber** to reduce FSTC can be compromised by other **dietary** factors such as **insoluble fiber**.

L3 ANSWER 9 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 2

TI Effects of enzymes in fibre-enriched baking.

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TI Effects of enzymes in fibre-enriched baking.

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SO Journal of the Science of Food and Agriculture, (Feb., 1998) Vol. 76, No. 2, pp. 239-249.
ISSN: 0022-5142.

DT Article

LA English

AB The aim of the present study was to improve the quality of **fibre**-enriched wheat breads by enzymic treatment of the **fibre** fraction. The suitability of different enzymes in **fibre**-enriched baking and their effects on the **dietary fibre** content and the ratio of **insoluble** : soluble **fibre** content of the breads were studied. The enzyme preparations used were a hemicellulolytic culture filtrate of Trichoderma reesei, a specific (pI 9) xylanase of T reesei and Fermizyme, an alpha-amylase preparation containing a standardized level of hemicellulase activity. Rye **bran** was extracted in water (10% (w/w) suspension) to determine the solubilities of the beta-glucans and pentosans. Addition of T reesei culture filtrate significantly increased the amount of extractable pentosan obtained from nonautoclaved rye **bran**. Rye **bran supplementation** (5%) of wheat flour increased the farinograph absorption and dough development time, but had little or no effect on stability and softening of the dough. The added enzymes decreased dough stability and increased softening. Addition of enzymes caused significant differences in the stickiness of the wheat doughs both with ($P < 0.003$) and without ($P < 0.001$) rye **bran**. Fermizyme significantly increased the stickiness of wheat doughs both with and without rye **bran**. The baking results of the **fibre**-enriched breads were improved by the added enzymes. Addition of T reesei culture filtrate increased the specific volume of the wheat breads both with and without rye **bran** by almost 20%. Enzyme mixtures were **more** efficient than individual xylanase in softening the bread crumb and reducing the staling rate of wheat breads both with and without rye **bran**. Incorporation of enzymes reduced the total **dietary fibre** content of the breads, but at **least** doubled the amount of soluble pentosan. The proportions of fluorescent cell walls in the breads were detected by microscopical image analysis. Enzyme addition caused the surface area of **insoluble** cell walls originating from wheat flours to decrease, suggesting that the enzymes exert **more** effects on wheat endosperm cell walls than on **bran** particles.

AB The aim of the present study was to improve the quality of **fibre**-enriched wheat breads by enzymic treatment of the **fibre** fraction. The suitability of different enzymes in **fibre**-enriched baking and their effects on the **dietary fibre** content and the ratio of **insoluble** : soluble **fibre** content of

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L3 ANSWER 10 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 5

TI The potential of an insoluble dietary fiber-rich source from barley to protect from DMH-induced intestinal tumors in rats.

AN 1993:301760 BIOSIS

DN PREV199396019985

TI The potential of an insoluble dietary fiber-rich source from barley to protect from DMH-induced intestinal tumors in rats.

AU McIntosh, G. H.; Jorgensen, L.; Royle, P.

CS Div. Human Nutrition, Commonwealth Scientific Industrial Research Organization, Adelaide, South Aust. 5000

SO Nutrition and Cancer, (1993) Vol. 19, No. 2, pp. 213-221. ISSN: 0163-5581.

DT Article

LA English

AB The influence of soluble and **insoluble dietary fiber supplements** from barely and wheat on colon cancer risk as assessed using male Sprague-Dawley rats from four weeks of age on a semipurified (AIN76A) rat diet modified to contain 20% fat of mixed animal and plant origin and 5% **dietary fiber**. Gastrointestinal tumors were induced with dimethylhydrazine give weekly for five weeks at 15 mg/kg body wt by subcutaneous injection, commencing four weeks after rats were established on the experimental diets. At 32 weeks of age, rats were killed and tumors assessed. The **insoluble dietary fiber**-rich source from barley (spent barley grain, SBG) was significnatly **more** effective at preventing induced tumors than soluble **fiber**-rich commercial barley **bran**. There were no significant differences among the results for the other three **fibers** sources, which were intermediate in their influence. Both incidence of rats affected and tumor mass index were reduced, the latter significantly, when SBG was compared with commercial barley **bran**. SBG also produced a significant reduction in plasma cholesterol concentration (down 17%, p lt 0.05) relative to wheat **bran**, but commercial barley **bran** was not different from wheat **bran** at this stage. Pure cellulose and outer-layer barley

bran were, by comparison, only moderately effective in cancer prevention. SBG, like whet **bran**, is a good source of cellulose and hemicellulose. It is also a good source of proteins, polyphenolics, fatty acids (including alpha-linolenic), vitamin E, and minerals. Further research is needed to clarify the relevance of these other factors to the differences observed. SBG as a **dietary fiber** source appears to be very effective in protecting rats from dimethylhydyazine-induced intestinal cancer.

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L3 ANSWER 11 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 6

TI INTERACTIVE EFFECTS OF OAT BRAN AND WHEAT BRAN ON SERUM AND LIVER LIPIDS AND COLONIC PHYSIOLOGY.

AN 1991:481555 BIOSIS

DN BA92:115315

TI INTERACTIVE EFFECTS OF OAT BRAN AND WHEAT BRAN ON SERUM AND LIVER LIPIDS AND COLONIC PHYSIOLOGY.

AU LUPTON J R; YUNG K-Y

CS HUMAN NUTR., TEXAS A AND M UNIV., COLLEGE STATION, TEX. 77843-2471.

SO CEREAL FOODS WORLD, (1991) 36 (9), 827-831.
CODEN: CFWODA. ISSN: 0146-6283.

FS BA; OLD

LA English

AB Studies in humans and rats show that oat **bran** lowers serum cholesterol whereas wheat **bran** does not. In contrast, wheat **bran** is **more** protective against experimentally induced colon cancer than is oat **bran**. The purpose of the present study was to determine whether a combination of oat **bran** and wheat **bran** could both lower serum cholesterol and positively affect colony physiology. Sixty male Sprague-Dawley rats (12 per group) were fed sufficient **fiber** from oat **bran** and wheat **bran** to result in the following amounts and combinations of **dietary fiber** in their diets: 1) 4% from oat **bran** + 4% from wheat **bran** (4 + 4); 2) 6% from oat **bran** + 2% from wheat **bran** (6 + 2); 3) 4% from oat **bran** only (4 OB); 4) 4% from wheat **bran** only (4 WB). Results were compared to a

control **supplemented** with 8% cellulose. The diet with the highest amount of oat **bran** (6 + 2) resultd in the lowest serum cholesterol value (143 .+-. 5 mg/100 ml), which was significantly lower than the control (180 .+-. 17) and 4% from wheat brain only (4 WB) (230 .+-. 10, [P < 0.01]). Similar amounts of oat **bran** resulted in similar cholesterol values despite the presence of wheat **bran**: 157 .+-. 5 (4 + 4) compared to 161 .+-. 5 (4 OB). In the colon, the addition of wheat **bran** to the oat **bran** diet did not mitigate the fermentative effects of oat **bran**, even though wheat brain was a better bulking agent, assessed by a greater fecal dry weight (4.29 .+-. 0.21 g for 72 hr compared to 3.63 .+-. 0.21 g, [P < 0.01]), probably due to a higher proportion of **insoluble fiber** . This study shows that adding wheat **bran** to oat **bran** does not negate the positive effects of the latter on serum lipids. However, neither does it overcome the negative effects of oat **bran** on colon physiology.

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L3 ANSWER 12 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 10
TI EFFECTS OF AN OATS FIBER TABLET AND WHEAT BRAN IN HEALTHY VOLUNTEERS.
AN 1986:342228 BIOSIS
DN BA82:56432
TI EFFECTS OF AN OATS FIBER TABLET AND WHEAT BRAN IN HEALTHY VOLUNTEERS.
AU VORSTER H H; LOTTER A P; ODENDAAL I
CS DEP. PHYSIOL., POTCHEFSTROOM UNIV. CHE, POTCHEFSTROOM.
SO S AFR MED J, (1986) 69 (7), 435-438.
CODEN: SAMJAF. ISSN: 0038-2469.
FS BA; OLD
LA English
AB The daily intake of total **dietary fibre** of a group of 18 healthy volunteers was raised from a mean of 22,1 g to 32 g by **supplementing** their diet with either 23 g wheat **bran** or 15 g oats **fibre** tablets in a cross-over design for two 3-week periods with a wash-out period of 4 weeks in between. Both **fibre** **supplements** improved mean glucose tolerance, although not

significantly. During the first period, total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C) and very-low-density lipoprotein cholesterol were significantly lowered by both **fibre** preparations. During the second period significant reductions in TC and LDL-C were obtained only in the group taking the oats **fibre** tablets. This could probably be explained as an effect of the gel-forming **fibre** components in oats **fibre**. High-density lipoprotein cholesterol concentrations remained unchanged. The oats **fibre** tablet also proved easier to take and caused fewer side-effects. This study shows that if **dietary fibre** concentrates are used to increase **fibre** intake in Western societies, better results will probably be obtained by using a **dietary fibre** concentrate or **mixture** of concentrates that contain both soluble and **insoluble** components.

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L3 ANSWER 13 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 11
TI EFFECTS OF DIETARY CONCENTRATES ON RUMEN DIGESTION OF FIBROUS FEEDSTUFFS.
AN 1986:296491 BIOSIS
DN BA82:30397
TI EFFECTS OF DIETARY CONCENTRATES ON RUMEN DIGESTION OF FIBROUS FEEDSTUFFS.
AU DIXON R M
CS SCH. AGRIC. FOR., UNIV. MELBOURNE, PARKVILLE, VICTORIA 3052, AUST.
SO ANIM FEED SCI TECHNOL, (1986) 14 (3-4), 193-202.
CODEN: AFSTDH. ISSN: 0377-8401.
FS BA; OLD
LA English
AB Three mature rumen cannulated steers were given Penniseteum purpureum forage (60-65 days regrowth) ad libitum, with and without a concentrate **supplement** (1.0 kg maize **bran** dry matter (DM) per 100 kg kg live weight). Eight feedstuffs (bagasse, bagasse treated with 8% NaOH, P. purpureum, Digitaria swasilandensis, dried brewers grains, Canavalia ensiformis hulls and leaf and sweet potato forage) were incubated in nylon bags in the rumen and the disappearance of DM **insoluble** in 0.15 M NaCl after 0, 8, 16, 24 and 72 h was measured. The half-time (T1/2) of disappearance of **insoluble** DM calculated for the first 24 h of incubation in the rumen was increased by **dietary** concentrates and this increase (.DELTA.T1/2) was related to the T1/2 of DM disappearance measured in steers given forage alone (T1/2) and to the cellulose content of the **insoluble** DM in each feedstuff. Also, separate linear relationships between .DELTA.T1/2/T1/2 and the cellulose content of **insoluble** DM were observed for the five graminaceous and the three non-graminaceous feedstuffs studied. The experiment showed that concentrate **supplementation** reduced **fibre**

digestion in the rumen **more** for graminaceous forages and this reduction was positively related to the rate of DM digestion in the absence of concentrates and to the cellulose content of the forage.

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L3 ANSWER 23 OF 28 BIOTECHNO COPYRIGHT 2002 Elsevier Science B.V.
AN 1996:26230641 BIOTECHNO
TI Wheat **bran** and psyllium diets: Effects on N-methylnitrosourea-induced mammary tumorigenesis in F344 rats
CT *bacterial enzyme; *beta glucuronidase; *estrogen; *ispagula; *methylnitrosourea; *breast adenocarcinoma; *breast carcinogenesis; *diet **supplementation**; *wheat **bran**; animal experiment; animal model; animal tissue; article; controlled study; **dietary fiber**; enzyme activity; estrogen excretion; estrogen urine level; feces; female; nonhuman; rat

L3 ANSWER 25 OF 28 FSTA COPYRIGHT 2002 IFIS
TI Serum lipids in hypercholesterolemic men and women consuming oat **bran** and amaranth products.
CC M (Cereals and Bakery Products)
CT AMARANTH GRAIN; **BRAN**; CHOLESTEROL; OATS; **OAT BRAN**

L3 ANSWER 26 OF 28 FSTA COPYRIGHT 2002 IFIS
TI Chemical and nutritional properties of potato peels and extrusion effects.
CC J (Fruits, Vegetables and Nuts)
CT ANTINUTRITIONAL FACTORS; EXTRUSION; HEALTH; NUTRITIONAL VALUES; PEEL; POTATOES; PROCESSING; VEGETABLES SPECIFIC

L3 ANSWER 27 OF 28 FEDRIP COPYRIGHT 2002 NTIS
TI BYPRODUCT FEEDSTUFFS: RUMEN DEGRADABILITY OF CARBOHYDRATE AND FAT FRACTIONS AND EFFECTS ON FEED EFFI
CT feed; animal nutrition; ruminant nutrition; byproducts; **citrus** pulp; **dietary** carbohydrates; **dietary** fats; feed composition; rumen fermentation; fermentation products; digestibility; hominy; feed **supplements**; rumen metabolism; lactation; feed efficiency; production efficiency; feed formulation; dairy cattle; feed nutritive value

L3 ANSWER 28 OF 28 FROSTI COPYRIGHT 2002 LFRA
TI Effect of the particle size of corn **bran** on the plasma cholesterol concentration, fecal output and cecal fermentation in rats.
SH NUTRITION
CT BLOOD CHOLESTEROL; **BRAN**; CAECUM; CEREAL **FIBRE**; CEREAL PRODUCTS; CEREALS; CHOLESTEROL; CORN **BRAN**; FAECES; FERMENTATION; **FIBRE**; GRAIN; PARTICLE PROPERTIES; PARTICLE SIZE; REDUCTION; STEROLS

L22 ANSWER 1 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI Effects of processing on the **dietary fiber content** of **wheat bran**, pureed green beans, and **carrots**
AN 1980:637212 CAPLUS
DN 93:237212
TI Effects of processing on the **dietary fiber content** of **wheat bran**, pureed green beans, and **carrots**
AU Anderson, N. E.; Clydesdale, F. M.
CS Dep. Food Sci. Nutr., Univ. Massachusetts, Amherst, MA, 01003, USA
SO J. Food Sci. (1980), 45(6), 1533-7
CODEN: JFDSAZ; ISSN: 0022-1147
DT Journal
LA English
AB The **dietary fiber** (DF) components of green beans and carrots were fractionated and analyzed utilizing methodol. developed by Anderson and Clydesdale (1980). Samples of each vegetable were examd. as purchased, after boiling for 30 min, and after retorting for 60 min. Also, a std. **wheat bran**, whose DF profile was previously detd. was analyzed after toasting for 30 and 60 min and after boiling for 30 min. Toasting significantly increased the lignin [9005-53-2] **content** of the **bran** and had little effect on the other components. Wet heat processing tended to first solubilize and then destroy the pectic substances in the pureed green beans, carrots, and **wheat bran**.

L22 ANSWER 2 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI Magnesium and calcium absorption in Fischer-344 rats influenced by changes in **dietary fiber** (**wheat bran**), fat and calcium
AN 1992:489256 CAPLUS
DN 117:89256
TI Magnesium and calcium absorption in Fischer-344 rats influenced by changes in **dietary fiber** (**wheat bran**), fat and calcium
AU Watkins, Don W.; Jahangeer, Saleem; Floor, Marianne K.; Alabaster, Oliver
CS Med. Cent., George Washington Univ., Washington, DC, USA
SO Magnesium Res. (1992), 5(1), 15-21
CODEN: MAGREF; ISSN: 0953-1424
DT Journal
LA English
AB Mg and Ca absorption were affected by changes in **dietary wheat bran fiber** and Ca, but not fat, in Fischer-344 rats when studied in a full factorial study that was a portion of a larger study of diet and colon carcinogenesis. For 4 wk, 9-wk-old rats were fed exptl. purified diets to which had been added: **wheat bran** 0, 2.5, 10, or 20%; fat 1, 5, or 10%; and Ca 0.18, 0.52, or 1.04% of diet wt. From day 26 to 29 all feces were collected in metabolic cages, and food consumption was noted. **Dietary** Mg intake and net Mg absorption increased in direct relation to the quantity of **wheat bran** in the diet. Calcium supplementation inhibited magnesium absorption of **fiber**-free diet, but had little effect on magnesium absorption when **fiber** was present. Fat had no measurable effect on magnesium absorption. A low **dietary fiber content** enhanced Ca absorption compared to that on a **fiber**-free diet. However, further increases in **fiber content** slightly inhibited calcium absorption. It is concluded that the magnesium **content** of **dietary wheat bran fiber** is available for absorption to rats. Ca supplementation inhibited Mg absorption in a **fiber**-free diet, but the presence of **dietary fiber** protected Mg absorption from the Ca

inhibition obsd. on a **fiber**-free diet. Absorption of Ca is increased by including some **fiber** in the diet. However, Ca absorption may be diminished slightly by increasing **wheat bran content** of the diet to a high level, probably through Ca binding and excretion with undigested **fiber**.

L22 ANSWER 3 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI Determination of the total pepsin-pancreatin indigestible **content** (**dietary fiber**) of soybean products, **wheat bran**, and corn **bran**
AN 1979:591437 CAPLUS
DN 91:191437
TI Determination of the total pepsin-pancreatin indigestible **content** (**dietary fiber**) of soybean products, **wheat bran**, and corn **bran**
AU Honig, David H.; Rackis, Joseph J.
CS Sci. Educ. Adm., NRRC, Peoria, IL, 61604, USA
SO J. Agric. Food Chem. (1979), 27(6), 1262-6
CODEN: JAFCAU; ISSN: 0021-8561
DT Journal
LA English
AB Successive pepsin and pancreatin digestions were used to det. the indigestible **content** (IDC) of various soybean products and cereal brans. IDC included insol. material as well as solubilized carbohydrate and protein sepd. by ultrafiltration (mol. wt. >5000). Total IDC in dry matter was: corn **bran** 97, soybean hulls 86, **wheat bran** 52, whole soybean 23, soybean protein conc. 40, and defatted soybean flakes 16%. The IDC values include 3-25% sol. material recovered by ultrafiltration. Chem. anal. of the insol. nondigestible fraction from soybean hulls indicated a compn. of cellulose [9004-34-6] 71, hemicellulose [9034-32-6] 20, lignin [9005-53-2] plus ash 9%. The protein digestibility was: whole soybean 68, defatted soybean flakes 81, soybean hulls 60, soybean protein conc. 61, corn **bran** 43, and **wheat bran** 60%. The large values for undigested protein in soybean protein products were unexpected.

L22 ANSWER 4 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI An analysis of the **dietary fiber content** of a standard **wheat bran**
AN 1980:179172 CAPLUS
DN 92:179172
TI An analysis of the **dietary fiber content** of a standard **wheat bran**
AU Anderson, N. E.; Clydesdale, F. M.
CS Dep. Food Sci. Nutr., Univ. Massachusetts, Amherst, MA, 01003, USA
SO J. Food Sci. (1980), 45(2), 336-40
CODEN: JFDSAZ; ISSN: 0022-1147
DT Journal
LA English
AB A certified, food grade **wheat bran** (no. RO7-3691) obtained from the American Assocn. of Cereal Chemists was analyzed by extg. ground samples with cold and hot water, followed by amylase hydrolysis or protease digestion and amylase hydrolysis, to obtain various carbohydrate fractions. Ests. were made of cold and hot water-sol. biopolymers as well as total pectic substances, hemicellulose [9034-32-6], cellulose [9004-34-6], and Klason lignin [9005-53-2]. Quant. and qual. anal. of the carbohydrate polymers was achieved by gas-chromatog. with two stationary phases (3% ECNSS-M on Gas Chrom Q 100-20 mesh or Supelco Sp-2340 on 100-20 mesh Supelcoport) and He carrier gas (40 mL/min) after the polymers had been hydrolyzed with acid and derivatized to form the resp. alditol acetates. The **wheat bran** contained 0.79% cold and a trace of hot water-sol. neutral polysaccharides, 2.17% total pectic substances, 28.45% hemicellulose, 9.84% cellulose, and 2.87% Klason lignin. These values agreed with those

estd. by other methods where available.

L22 ANSWER 5 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI Comparative evaluation of the effects of two different forms of **dietary fiber** (rice **bran** vs. **wheat bran**) on rat colonic mucosa and fecal microflora
AN 1995:329124 CAPLUS
DN 122:104744
TI Comparative evaluation of the effects of two different forms of **dietary fiber** (rice **bran** vs. **wheat bran**) on rat colonic mucosa and fecal microflora
AU Gestel, Gilles; Besancon, Pierre; Rouanet, Jean-Max
CS Unite Nutr., Univ. Montpellier-II, Montpellier, Fr.
SO Annals of Nutrition & Metabolism (1994), 38(5), 249-56
CODEN: ANUMDS; ISSN: 0250-6807
PB Karger
DT Journal
LA English
AB The aim of the study was to compare the physiol. consequences of two **dietary fiber** sources on the fecal microflora and colonic mucosal growth in rats. The studied sources, a moderately sol. **fiber** (rice **bran**, RB) and a less sol. **fiber** (**wheat bran**, WB), were included in diets of rats at a level of 10% for 3 wk and compared with a totally **fiber**-deprived diet. RB significantly increased fecal water compared to the control diet. Fecal nitrogen **content** and bacterial mass, as estd. from the 2,6-diaminopimelic acid (DAPA) output, were greatly and significantly increased by RB, and to a lesser extent by WB, compared to the control diet. Total bile acid excretion was significantly higher by rats fed RB than by those fed WB. Fecal bacterial enzyme activities tested (.beta.-glucuronidase, mucinase and nitroreductase) were significantly reduced by the two different **fiber** sources, but RB was more effective than WB, except for nitroreductase activity which was reduced at the same level for each **fiber** source. Although measurements of mucosal colonic wt. and RNA **content** were significantly different between groups fed RB and WB, DNA **content** and the ratio RNA/DNA did not significantly differ between these groups. The results indicate that the differential changes obsd. in .beta.-glucuronidase and mucinase activities and DAPA and bile acid excretion may depend on the nature of the **fiber** consumed. They also suggest that RB, which had similar effects, sometimes more marked than WB, on the studied parameters, may be a new valuable **fiber** source.

L22 ANSWER 6 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI Enzymic determination of soluble and insoluble **dietary fiber** in rice and **wheat bran**
AN 1999:55517 CAPLUS
DN 130:251325
TI Enzymic determination of soluble and insoluble **dietary fiber** in rice and **wheat bran**
AU Goncalvez, Alex Augusto; Badiale-Furlong, Eliana; De Souza-Soares, Leonor Almeida; Siervs, Simone Treibs
CS Fundacao Universidade de Rio Grande-FURG, Rio Grande, Brazil
SO Archivos Latinoamericanos de Nutricion (1998), 48(4), 334-338
CODEN: ALANBH; ISSN: 0004-0622
PB Sociedad Latinoamericana de Nutricion
DT Journal; General Review
LA English
AB The information about **dietary fiber** presents controversies in many research areas such as in nomenclature, related illnesses, recommended quantities and terminol., mainly because of lack of anal. data. Different needs and interests for the **dietary fiber** compn. of foods and forages have led to a proliferation of methods for its anal. This research, a further adaptation of the enzymic

method of Asp et al. (1983) for its application is proposed for rice and **wheat bran**, byproducts of agroindustries in the southern region of Rio Grande do Sul (Brazil). The inclusion of amyloglucosidase in the proposed methodol. contributed to the decrease in the **content** of residual starch at the end of the expt., like Prosky et al (1992). To increase the efficiency of the enzyme system in this type of samples, other changes were made with respect to incubation time and proteolytic enzyme concn. In the final adaptation, a decrease of 51.33% of the starch **content** was obsd. in rice **bran** (RB) and of 52.93% in **wheat bran** (WB). This decrease was also verified in the model system (MS) (52.08%), which demonstrates the adequacy of the proposed adaptation. With respect to the residual protein, it was verified that the measures adopted provoked a redn. of 42.15% (RB), 52.19% (WB) and 42.11% (MS) as compared to the original method. Then the proposed conditions has been shown to be efficient in decreasing the level of interference (indigestible starch and protein) in the quantification of **dietary fiber** in rice and **wheat bran**. All this and more was reviewed with 11 refs.

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L22 ANSWER 7 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI **Dietary fiber content** of corn **bran**
AN 1980:619469 CAPLUS
DN 93:219469
TI **Dietary fiber content** of corn **bran**
AU Anderson, N. E.; Clydesdale, F. M.
CS Dep. Food Sci. Nutr., Univ. Massachusetts, Amherst, MA, 01003, USA
SO J. Food Prot. (1980), 43(10), 760-2
CODEN: JFPRDR; ISSN: 0362-028X
DT Journal
LA English
AB The **dietary fiber** (DF) **content** in a com. corn **bran** flour was estd. and analyzed by using a fractionation procedure developed previously. This method includes estn. of cold and hot water-sol. biopolymers as well as total pectic substances, hemicellulose [9034-32-6], cellulose [9004-34-6], and Klason lignin [8068-04-0]. Quant. and qual. anal. of the neutral sugars in the carbohydrate polymers was achieved by gas chromatog. Acidic sugars were estd. by a modified carbazole reaction. The corn **bran** flour was estd. to contain 50.12% total DF. The DF was composed of 34.49% hemicellulose, 12.34% cellulose, 0.23% Klason lignin, and 3.06% total pectic substances. These values were similar to those obtained from the anal. of a std. **wheat bran** with the same methodol. in another study.

L22 ANSWER 8 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI A possible role of the **dietary fiber** product, **wheat bran**, as a nitrite scavenger
AN 1989:93873 CAPLUS
DN 110:93873
TI A possible role of the **dietary fiber** product, **wheat bran**, as a nitrite scavenger
AU Moeller, M. E.; Dahl, R.; Boeckman, O. C.
CS Norsk Hydro Res. Cent., Porsgrunn, N-3901, Norway
SO Food Chem. Toxicol. (1988), 26(10), 841-5
CODEN: FCTOD7; ISSN: 0278-6915
DT Journal
LA English
AB **Wheat bran** acted as a nitrite scavenger under conditions similar to those that exist in the stomach. **Wheat** flour and cellulose did not act as nitrite scavengers. **Wheat bran**, at a concn. equiv. to that in the stomach after ingestion of

.apprx.2 pieces of whole-**wheat** bread, reduces the nitrite concn. from 20 .mu.M to .apprx.10 .mu.M in 60 min at pH 3.5 and 37.degree.. At pH 2.5 and 1.5, most of the nitrite had disappeared in 10 min. At pH .ltoreq.2.5, the nitrite-scavenging effect of **bran** was as efficient as that of ascorbic acid. Ferulic acid, a component of brain, reacted rapidly with 20 .mu.M nitrite both a pH 3.5 and 1.5, whereas phenolic lignin model compds. only reacted at pH 1.5.

L22 ANSWER 9 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI Effects of **dietary fiber** from **wheat**, corn, and soy hull **bran** on excretion of fecal bile acids in humans
AN 1981:423380 CAPLUS
DN 95:23380
TI Effects of **dietary fiber** from **wheat**, corn, and soy hull **bran** on excretion of fecal bile acids in humans
AU Bell, Edward W.; Emken, Edward A.; Klevay, Leslie M.; Sandstead, Harold H.
CS Northern Reg. Res. Cent., USDA, Peoria, IL, 61604, USA
SO Am. J. Clin. Nutr. (1981), 34(6), 1071-6
CODEN: AJCNAC; ISSN: 0002-9165
DT Journal
LA English
AB Effects of **dietary fiber** on bile acid excretion and fecal bile acid concn. were studied for 7 subjects fed 26 g of either soft white **wheat bran**, corn **bran**, soybean hulls, or hard red spring **wheat bran**. Results indicate that even in a controlled study, individual subject variation has a major impact on fecal bile acid excretion. No significant change in the compn. of fecal bile acids could be assocd. with the decrease in serum lipid levels previously reported. A method for the isolation and quantitation of fecal bile acids is described which does not require purifn. by thin-layer chromatog. A preliminary study of lyophilized fecal samples stored at -10 to -30.degree. showed very little or no change in bile acid **content**. Samples stored at room temps. for 11 mo showed a substantial redn. in bile acid **content**.

L22 ANSWER 10 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI In vitro fermentation of swine ileal digesta containing oat **bran** **dietary fiber** by rat cecal inocula adapted to the test **fiber** increases propionate production but fermentation of **wheat bran** ileal digesta does not produce more butyrate
AN 2000:154308 CAPLUS
DN 132:293136
TI In vitro fermentation of swine ileal digesta containing oat **bran** **dietary fiber** by rat cecal inocula adapted to the test **fiber** increases propionate production but fermentation of **wheat bran** ileal digesta does not produce more butyrate
AU Monsma, David J.; Thorsen, Peter T.; Vollendorf, Nicholas W.; Crenshaw, Thomas D.; Marlett, Judith A.
CS Department of Nutritional Sciences, University of Wisconsin-Madison, Madison, WI, 53706, USA
SO Journal of Nutrition (2000), 130(3), 585-593
CODEN: JONUAI; ISSN: 0022-3166
PB American Society for Nutritional Sciences
DT Journal
LA English
AB The effects of oat **bran** (OB) and **wheat bran** (WB) on in vitro fermn. patterns in swine intestinal ileal **content** were compared with in vivo data. Ileal digesta samples were collected from pigs fed OB and WB and lyophilized. The samples were fermented for 0-96 h in an anaerobic in vitro system using inocula prepd. from ceca of rats fed the same **fiber** sources. Carbohydrate and short-chain fatty acid (SCFA) contents in the fermn. systems were measured by GC. The fermn. of WB digesta did not produce more n-butyrate and was slower than the fermn. of OB digesta. The OB digesta fermn. produced greater molar

proportions of propionate. Bacterial mass increased more and was maintained longer during the fermn. of OB digesta than the WB digesta. Thus, diln. of undigested WB **fiber** and not n-butyrate prodn. is one mechanism by which WB may protect colonic mucosa. Propionate prodn. was increased during fermn. of .beta.-glucan in OB. The in vitro system using physiol. sources of rat inoculum and pig substrate contg. WB and OB yielded results that agreed with in vivo data from humans and rats.

RE.CNT 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L22 ANSWER 11 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI Particle size distribution and solubility of **dietary fiber** in swede (Brassica napus)-based and **wheat-bran**-based diets during gastrointestinal transit in the pig
AN 1992:234441 CAPLUS
DN 116:234441
TI Particle size distribution and solubility of **dietary fiber** in swede (Brassica napus)-based and **wheat-bran**-based diets during gastrointestinal transit in the pig
AU Robertson, James A.; Murison, Sandra D.; Chesson, Andrew
CS Inst. Food Res., Norwich Lab., Norwich, NR4 7UA, UK
SO J. Sci. Food Agric. (1992), 58(2), 197-205
CODEN: JSFAAE; ISSN: 0022-5142
DT Journal
LA English
AB Changes in **fiber** soly, particle size, and distribution and microbial activity during gut transit in pigs fed either a swede-based or **wheat bran**-based diet were monitored. Digesta samples recovered from the stomach, ileum, and cecum, together with feed and fecal samples, were examd. for changes in the chem. and phys. properties of the **fiber** fraction. Soly. of swede **fiber** was increased in the upper gut where a four-fold redn. in particle size and change in particle size distribution also occurred. This was assocd. with a loss of pectic polysaccharide. Little change in **bran** properties were noted in the foregut although the shape of **bran** particles was modified in the large intestine. Overall loss of the **fiber** fraction during gut transit was 41.5% for **bran** and 87.8% for swede. Microbial colonization of the upper gut was significant on both diets. Chem. conditions during transit were thought to predispose pectic polysaccharides to solubilization, and to encourage tissue maceration and, hence, particle size redn. Lack of pectic polysaccharides in **wheat bran** and/or lignification maintained particle integrity in this diet. These properties may be important in influencing the physiol. response to **fiber** in the diet.

L22 ANSWER 12 OF 33 CAPLUS COPYRIGHT 2002 ACS
TI **Dietary fiber** and cholesterol and bile acid metabolisms in axenic (germfree) and holoxenic (conventional) rats. I. Effect of **wheat bran**
AN 1982:437892 CAPLUS
DN 97:37892
TI **Dietary fiber** and cholesterol and bile acid metabolisms in axenic (germfree) and holoxenic (conventional) rats. I. Effect of **wheat bran**
AU Sacquet, E. Leprince, C.; Riottot, M.
CS Inst. Natl. Rech. Agron., Cent. Natl. Rech. Zool., Jouy-en-Josas, 78350, Fr.
SO Reprod., Nutr., Dev. (1982), 22(2), 291-305
CODEN: RNDED4; ISSN: 0181-1916
DT Journal
LA English
AB Axenic (GF) and holoxenic (CV) rats were given a semisynthetic diet contg. no **fiber** (0) or 10% **bran** (B). The **bran** diet did not change body growth, food intake, or cecal water **content**.

It caused only a slight decrease in the digestive utilization of the diet in the holoxenic rats and a decline in cecal wt. in the axenic rats. The **bran** diet modified unabsorbed cholesterol [57-88-5] transit in both types of rats, and slightly altered **dietary** cholesterol absorption which was a little lower in axenics than in holoxenics. In the former (GF), the **bran**-contg. diet did not change either the plasma or the hepatic cholesterol concn. In the latter (CV), it increased plasma cholesterol which was lower in CVO rats than in the other 3 groups and decreased hepatic cholesterol which was thus lower in the CVB lot than in the others. The **bran** diet reduced fecal cholesterol elimination in axenic and holoxenic rats. This decrease was a little higher in the latter. The digestive tract microbial flora was thus implicated in the effect of **bran** on those characteristics of cholesterol metab. The **bran** did not change fecal bile acid compn. in the axenics. In the holoxenics, it contributed to make this compn. uniform because, without **bran**, individual compns. varied. The microbial flora thus changed many aspects of **bran** action on cholesterol and bile acid metabs. But total cholesterol and bile acid elimination was only slightly affected by those 2 factors.

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(FILE 'HOME' ENTERED AT 11:30:01 ON 18 SEP 2002)

INDEX 'ADISALERTS, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, AQUASCI,
BIOBUSINESS, BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA,
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DDFU, DGENE, DRUGB, DRUGLAUNCH, DRUGMONOG2, ...' ENTERED AT 11:31:17 ON
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          4   FILE USPATFULL
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L9          27 S ROSS/AU
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L11          0 S DIETARY FIBER CONTENT WHEAT BRAN
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     FILE 'CAPLUS, BIOSIS, FSTA, AGRICOLA, SCISEARCH, CABA, MEDLINE,
     BIOBUSINESS, FROSTI, CONFSCI, EMBASE, IFIPAT, JICST-EPLUS, TOXCENTER,
     USPATFULL, WPIDS' ENTERED AT 11:59:49 ON 18 SEP 2002
L19           64 S L18
L20           34 DUP REM L19 (30 DUPLICATES REMOVED)
L21           33 S L20 NOT L3
L22           33 FOCUS L21 1-
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AN 93:237212 CA

TI Effects of processing on the dietary **fiber** content of wheat bran, pureed green beans, and carrots

AU Anderson, N. E.; Clydesdale, F. M.

CS Dep. Food Sci. Nutr., Univ. Massachusetts, Amherst, MA, 01003, USA

SO **J. Food Sci.** (**1980**), 45(6), 1533-7
CODEN: JFDSAZ; ISSN: 0022-1147

DT Journal

LA English

AB The dietary fiber (DF) components of green beans and carrots were fractionated and analyzed utilizing methodol. developed by Anderson and Clydesdale (1980). Samples of each vegetable were examd. as purchased, after boiling for 30 min, and after retorting for 60 min. Also, a std. wheat bran, whose DF profile was previously detd. was analyzed after toasting for 30 and 60 min and after boiling for 30 min. Toasting significantly increased the lignin [9005-53-2] content of the bran and had little effect on the other components. Wet heat processing tended to first solubilize and then destroy the pectic substances in the pureed green beans, carrots, and wheat bran.

AN 92:179172 CA
TI An analysis of the dietary **fiber** content of a standard wheat bran
AU Anderson, N. E.; Clydesdale, F. M.
CS Dep. Food Sci. Nutr., Univ. Massachusetts, Amherst, MA, 01003, USA
SO **J. Food Sci.** (**1980**), 45(2), 336-40
CODEN: JFDSAZ; ISSN: 0022-1147
DT Journal
LA English
AB A certified, food grade wheat bran (no. RO7-3691) obtained from the American Assocn. of Cereal Chemists was analyzed by extg. ground samples with cold and hot water, followed by amylase hydrolysis or protease digestion and amylase hydrolysis, to obtain various carbohydrate fractions. Ests. were made of cold and hot water-sol. biopolymers as well as total pectic substances, hemicellulose [9034-32-6], cellulose [9004-34-6], and Klason lignin [9005-53-2]. Quant. and qual. anal. of the carbohydrate polymers was achieved by gas-chromatog. with two stationary phases (3% ECNSS-M on Gas Chrom Q 100-20 mesh or Supelco Sp-2340 on 100-20 mesh Supelcoport) and He carrier gas (40 mL/min) after the polymers had been hydrolyzed with acid and derivatized to form the resp. alditol acetates. The wheat bran contained 0.79% cold and a trace of hot water-sol. neutral polysaccharides, 2.17% total pectic substances, 28.45% hemicellulose, 9.84% cellulose, and 2.87% Klason lignin. These values agreed with those estd. by other methods where available.

AN 86:47169 AGRICOLA
DN FNI86010466
TI Dietary **fiber** constituents of selected fruits and vegetables.
AU Ross, J.K.; English, C.; Perlmutter, C.A.
AV DNAL (389.8 AM34)
SO **Journal of the American Dietetic Association, Sept 1985.**
Vol. 85, No. 9. p. 1111-1116 charts
Publisher: Chicago, Ill. : The Association.
CODEN: JADAAE; ISSN: 0002-8223
Target Audience: Specialized
NTE Includes 25 references.
DT Article
FS U.S. Imprints not USDA, Experiment or Extension
LA English
AB Extract: Dietary fiber, neutral detergent fiber, cellulose, hemicellulose, lignin, and pectin were compared in selected fresh and processed fruits and vegetables. Fresh fruits in gram per 100 gm wet weight contain decreasing dietary fiber as follows: apples, peaches, strawberries, and oranges. Fresh-cooked vegetables in gram per 100 gm wet weight contain decreasing dietary fiber as follows: green beans, carrots, potatoes, and tomatoes. Few differences were seen when stores, brands, and varieties of fruits and vegetables were compared. (author)

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FILE 'USPATFULL' ENTERED AT 07:00:37 ON 19 SEP 2002
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FILE COVERS 1971 TO PATENT PUBLICATION DATE: 17 Sep 2002 (20020917/PD)
FILE LAST UPDATED: 17 Sep 2002 (20020917/ED)
HIGHEST GRANTED PATENT NUMBER: US6453473
HIGHEST APPLICATION PUBLICATION NUMBER: US2002129432
CA INDEXING IS CURRENT THROUGH 17 Sep 2002 (20020917/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 17 Sep 2002 (20020917/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2002
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2002

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>>>  original, i.e., the earliest published granted patents or         <<<
>>>  applications.  USPAT2 contains full text of the latest US         <<<
>>>  publications, starting in 2001, for the inventions covered in     <<<
>>>  USPATFULL.  A USPATFULL record contains not only the original     <<<
>>>  published document but also a list of any subsequent              <<<
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>>>  publications.  The publication number, patent kind code, and      <<<
>>>  publication date for all the US publications for an invention     <<<
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This file contains CAS Registry Numbers for easy and accurate
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=> s l2
        157749 INSOLUBLE
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         30062 FIBRE
          9126 DIETARY
           126 INSOLUBLE (W) (FIBER OR FIBRES OR FIBERS OR FIBRE) (S) DIETARY
         15190 JUICE
         17186 EXTRACTOR
           213 JUICE (W) EXTRACTOR
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               AND JUICE (W) EXTRACTOR

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L3   ANSWER 1 OF 1  USPATFULL
TI     Fruit juice plus citrus fiber


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        201306 FIBERS
         25553 FIBRES
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          1989 HEMICELLULOSE
         14623 LIGNIN
             0 PUMMACE
         15353 APPLE
         68102 ORANGE
           754 CRANBERRY
          5883 GRAPE
          2991 CARROT
L4           1 (MIXTURE OR MIXTURES OR BLEND OR BLENDS) (S) (FIBRE OR FIBER OR
               FIBERS OR FIBRES) (S) INSOLUBLE (S) DIETARY (S)(CELLULOSE OR
               HEMICELLULOSE OR LIGNIN OR PUMMACE) (S) (APPLE OR ORANGE OR
               CRANBERRY OR GRAPE OR CARROT)

=> d ti
```

USPATFULL

TI Lyophilized health food products and methods of making same

AN 97:26948 USPATFULL

TI Lyophilized health food products and methods of making same

IN Haast, William E., 34879 Washington Loop Rd., Punta Gorda, FL, United States 33982
Harrell, Nancy G., 34879 Washington Loop Rd., Punta Gorda, FL, United States 33982

PI US 5616355 19970401
AI US 1995-463882 19950605 (8)
RLI Continuation-in-part of Ser. No. US 1994-185046, filed on 24 Jan 1994, now abandoned
DT Utility
FS Granted
EXNAM Primary Examiner: Pratt, Helen
LREP Darnell, Kenneth E.
CLMN Number of Claims: 14
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 570

AB Food products and methods of making having a high dietary fiber content and unexpected organoleptic characteristics, the invention takes the form of a substantially solid or semi-solid substrate formed primarily of dietary fiber soaked in or permeated by a flavorful material such as a natural juice, liquefied or pureed fruit or the like, the combination then being at least partially lyophilized to a solid or semi-solid consistency. The concentration of the natural juice or other flavorful material within a framework or lattice provided by the dietary fiber causes a burst of flavor to be experienced when eaten. While the lyophilized substrate can preferably be consumed as a bar-like comestible with or without the addition of other materials such as coatings, fillers and the like, the invention contemplates the formation of the substrate as flakes, as a cookie, as a candy such as a semi-soft roll or sheet consumed flat or as a rolled sheet among other forms.

DETD The **dietary fiber** can take the form of natural plant **fibers** including wheat bran, oat bran, soy **fiber**, **apple fiber**, corn bran, barley bran, rye bran, triticale bran, **cellulose**, pea **fiber**, sugar beet **fiber**, peanut **fiber** and the like, these materials generally being referred to as **insoluble fibers**. Such **insoluble fibers** can be utilized alone according to the invention or can be formed with soluble **fibers** which include, but are not limited to, gum arabic, ~~gum ghatti~~, guar gum, pectins, psyllium, carrageenans, zanthan, tragacanth, caraya, locust bean gum, agar and alginates. Suitable food binders can also be employed which include rice flour, wheat flour, oat flour, corn flour, rye flour, potato flour, and **mixtures** thereof to name but a few. It is to be understood that the invention can be practiced without the use of binders. It is also to be understood that the **dietary fiber** component of the invention preferably comprises more than 50% of the **fiber** as **insoluble fiber**, but is not so limited.

TI Cranberry seed flour for use in food for non-human animals, cosmetics, skin/hair care products, nutraceuticals such as antioxidants, and pharmaceuticals, comprises a preset concentration of insoluble fiber.
AN 2002-498769 [53] WPIDS
DNC C2002-141254
TI Cranberry seed flour for use in food for non-human animals, cosmetics, skin/hair care products, nutraceuticals such as antioxidants, and pharmaceuticals, comprises a preset concentration of insoluble fiber.
DC D21
IN HEEG, T; LAGER, B G
PA (HEEG-I) HEEG T; (LAGE-I) LAGER B G
CYC 1
PI US 6391345 B1 20020521 (200253)* 5p
ADT US 6391345 B1 Provisional US 2000-203775P 20000512, US 2000-597593 20000616
PRAI US 2000-203775P 20000512; US 2000-597593 20000616
AB US 6391345 B UPAB: 20020820
NOVELTY - A cranberry seed flour comprising insoluble fiber in a concentration of 40-50% weight of the flour, is new.

USE - In foods for non-human animals, cosmetics, skin care products, sun screens, coloring agents, soap, hair care products, and nutraceuticals such as antioxidants and pharmaceuticals.

ADVANTAGE - A single process for **cranberry** waste products yields two products; flour and oil. The flour is an excellent source of dietary calcium, potassium and iron, and **dietary insoluble fiber**. The flour may be packaged as a free-flowing material in bulk or may be tableted.

Dwg.0/1
AB US 6391345 B UPAB: 20020820
NOVELTY - A cranberry seed flour comprising insoluble fiber in a concentration of 40-50% weight of the flour, is new.

USE - In foods for non-human animals, cosmetics, skin care products, sun screens, coloring agents, soap, hair care products, and nutraceuticals such as antioxidants and pharmaceuticals.

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Dwg.0/1

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NEWS 4	Apr 09	ZDB will be removed from STN
NEWS 5	Apr 19	US Patent Applications available in IFICDB, IFIPAT, and IFIUDB
NEWS 6	Apr 22	Records from IP.com available in CAPLUS, HCAPLUS, and ZCAPLUS
NEWS 7	Apr 22	BIOSIS Gene Names now available in TOXCENTER
NEWS 8	Apr 22	Federal Research in Progress (FEDRIP) now available
NEWS 9	Jun 03	New e-mail delivery for search results now available
NEWS 10	Jun 10	MEDLINE Reload
NEWS 11	Jun 10	PCTFULL has been reloaded
NEWS 12	Jul 02	FOREGE no longer contains STANDARDS file segment
NEWS 13	Jul 22	USAN to be reloaded July 28, 2002; saved answer sets no longer valid
NEWS 14	Jul 29	Enhanced polymer searching in REGISTRY
NEWS 15	Jul 30	NETFIRST to be removed from STN
NEWS 16	Aug 08	CANCERLIT reload
NEWS 17	Aug 08	PHARMAMarketLetter(PHARMAML) - new on STN
NEWS 18	Aug 08	NTIS has been reloaded and enhanced
NEWS 19	Aug 19	Aquatic Toxicity Information Retrieval (AQUIRE) now available on STN
NEWS 20	Aug 19	IFIPAT, IFICDB, and IFIUDB have been reloaded
NEWS 21	Aug 19	The MEDLINE file segment of TOXCENTER has been reloaded
NEWS 22	Aug 26	Sequence searching in REGISTRY enhanced
NEWS 23	Sep 03	JAPIO has been reloaded and enhanced
NEWS 24	Sep 16	Experimental properties added to the REGISTRY file
NEWS 25	Sep 16	Indexing added to some pre-1967 records in CA/CAPLUS
NEWS 26	Sep 16	CA Section Thesaurus available in CAPLUS and CA

NEWS EXPRESS	February 1 CURRENT WINDOWS VERSION IS V6.0d, CURRENT MACINTOSH VERSION IS V6.0a(ENG) AND V6.0Ja(JP), AND CURRENT DISCOVER FILE IS DATED 05 FEBRUARY 2002
NEWS HOURS	STN Operating Hours Plus Help Desk Availability
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NEWS WWW	CAS World Wide Web Site (general information)

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FILE 'HOME' ENTERED AT 06:48:15 ON 19 SEP 2002

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The following files are available:

1MOBILITY - Global Mobility Database from 1906-present
2MOBILITY - Global Mobility Standards Database
ABCD - German Manufacturers: ABC der Deutschen Wirtschaft
ADISALERTS - Adis LMS Drug Alerts 1983-present
ADISINSIGHT - Adis R&D Insight 1986-present
ADISNEWS - Adis Newsletters 1983-present
AEROSPACE - Aeroplus Access Database 1962-present
AGRICOLA - AGRICulture OnLine Access from 1970 - present
ALFRAC - Aluminum Fracture Toughness Data Base
ALUMINIUM - Aluminium Industry Abstracts 1968 to the present
ANABSTR - Analytical Abstracts
AQUASCI - Aquatic Sciences & Fisheries Abstracts 1978-present
AQUIRE - Acquatic Toxicity Information Retrieval
ASMDATA - Materials Database
BABS - BEILSTEIN Abstracts 1980-present
BEILSTEIN - BEILSTEIN File of Organic Compounds
BIBLIODATA - GERMAN NATIONAL BIBLIOGRAPHY FROM 1945 - PRESENT
BIOBUSINESS - BioBusiness/RN from 1985 - present
BIOCOMMERCE - Biocommerce Abstracts and Directory 1981-present
BIOSIS - The BIOSIS Previews(R)/RN File 1969-present
BIOTECHABS - Derwent Biotechnology Resource 1982-present
BIOTECHDS - Derwent Biotechnology Resource 1982-present (Subsc.)
BIOTECHNO - BIOTECHNOBASE 1980 to the present
BLLDB - LINGUISTIC LITERATURE from 1971-present
CA - The Chemical Abstracts File 1947-present
CABA - CAB ABSTRACTS 1973-present
CANCERLIT - Cancer Literature Online 1963-present
CAOLD - The pre-1967 Chemical Abstracts File
CAPLUS - The Chemical Abstracts Plus File 1947-present
CASREACT - The Chemical Abstracts Reaction Search Service
CBNB - Chemical Business NewsBase from 1984-present
CEABA-VTB - Chem Eng and Biotech Abstr - Verfahrenstechn Ber 1966-
CEN - Chemical & Engineering News 1990-January 2001
CERAB - Ceramic Abstracts from 1976
CFR - Code of Federal Regulations 1997 - present
CHEMCATS - CHEMICAL CATALOGS ONLINE 1993-1997
CHEMINFORMRX - The CHEMINFORMRX Reaction Search Service
CHEMLIST - Regulated Chemicals Listing
CHEMREACT - The CHEMREACT Reaction Search System
CHEMSAFE - CHEMSAFE - chemical safety information
CIN - The Chemical Industry Notes File for 1974-present
COMPENDEX - COMPENDEX*PLUS File from 1970 - present
COMPUAB - Computer & Information Systems Abstracts 1981-present
COMPUSCIENCE - Computerscience from 1972-present
CONF - Conferences in Energy, Physics, Mathematics etc.
CONFSCI - Conference Papers Index from 1973-present
COPPERDATA - Copper and Copper Alloy Standards and Data
COPPERLIT - Copper Literature Database
CORROSION - Corrosion Abstracts 1980 to the present
CROPB - Derwent Crop Protection File 1968 - 1984
CROPR - Derwent Crop Protection Registry
CROPU - Derwent Crop Protection File 1985 - present
CSCHEM - ChemSources - USA and International (Chemicals)
CSCORP - ChemSources - USA and International (Company Directory
CSNB - Chemical Safety News Base from 1981-present
DDFB - Derwent Drug File, Backfile 1964 - 1982
DDFU - Derwent Drug File from 1983 - present
DEMAS - German Trademarks 1894 - Present
DETHERM - DETHERM-DECHEMA thermophysical property database

DGENE - Derwent Geneseq Database 1981 - present
DIOGENES - FDA Regulatory Updates 1976-present
DIPPR - AIChE Design Inst. Physical Property Data File
DJSMDS - Derwent Reaction Search Service DJSM (Subscribers)
DJSMONLINE - Derwent Reaction Search Service DJSM
DKF - The German Automotive Engineering Database 1974-date
DKILIT - The DKI Literature Database on Polymers from 1973-pres
DPCI - Derwent Patents Citation Index 1978 to present
DRUGB - Derwent Drug File, Backfile 1964 - 1982 (Subscribers)
DRUGLAUNCH - IMSworld Drug Launches from 1982-present
DRUGMONOG - IMSworld Drug Monographs 1960s-present (with prices)
DRUGMONOG2 - IMSworld Drug Monographs 1960s-present (without prices
DRUGNL - IMSworld Drug News from 1991-present
DRUGPAT - IMSworld Drug Patents International from 1987-present
DRUGU - Derwent Drug File from 1983-present (Subscribers)
DRUGUPDATES - IMSworld Drug Updates from 1977-present
ELCOM - Electronics & Communications Abstracts 1981-present
EMA - Engineered Materials Abstracts File from 1986-present
EMBAL - EMBASE Alert
EMBASE - EMBASE File from 1974-present
ENCOMPLIT - EnCompass Literature File 1964-present (Supporters)
ENCOMPLIT2 - EnCompass Literature File 1964-Present (Non-Supporters
ENCOMPPAT - EnCompass Patent File 1964-present (Supporters)
ENCOMPPAT2 - EnCompass Patent File 1964-Present (Non-Supporters)
ENERGY - DOE ENERGY file from 1974-present
ENTEC - FIZ Karlsruhe and FIZ Technik Energy file from 1964-pr
ESBIOBASE - Elsevier Biobase 1994 to the present
EUMAS - European community trademarks 1996 - Present
EUROPATFULL - European (EP) Patents full text from 1996 - present
EUROPEX - ABC Europe Production Europex
EVENTLINE - EVENTLINE- Events worldwide 1989-2000+
FEDREGFULL - Federal Register Oct. 1997-present
FEDRIP - Federal Research in Progress Database
FOMAD - International Food Market Data 1982 to present
FOREGE - Foodline: Current Food Legislation
FORIS - Research in social sciences from 1999 - 2000
FORKAT - BMBF Foerderkatalog
FROSTI - Foodline: Food Science and Technology 1972 to present
FSTA - Food Science Technology Abstracts from 1969 - present
GENBANK - Genetic Sequence Data Bank
GEOREF - GeoRef - Geological Reference File from 1785-present
GMELIN - Gmelin Handbook of Inorganic Chemistry
HCA - CA File with hour-based pricing
HCAOLD - Pre-1967 CA File with hour-based pricing
HCAPLUS - CAPLUS File with hour-based pricing
HCHEMLIST - Regulated Chemicals Listing with hour-based pricing
HCIN - The CIN File for 1974-present with hour-based pricing
HEALSAFE - Health and Safety Science Abstracts 1981-present
HODOC - CRC HANDBOOK of DATA on ORGANIC COMPOUNDS, 2nd Edition
HOME - The default login file. Contains no data.
HSDB - Hazardous Substances Databank
ICONDA - International Construction Database from 1976-present
ICSD - ICSD - Inorganic Crystal Structure Data File
IFICDB - The IFI Comprehensive Database from 1950-present
IFICLS - The IFI Current Patent Legal Status Database
IFIPAT - The IFI Patent Database from 1950-present
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IFIUDB - The IFI Uniterm Database from 1950-present
IMSDRUGCONF - IMSworld Pharmaceutical Meetings Diary
IMSPROFILES - IMSworld Pharmaceutical Company Profiles
INFODATA - Information Science and Work from 1976 to present
INIS - International Nuclear Information System 1970-present
INPADOC - The International Patent Database from 1968-present
INSPEC - INSPEC2 File from 1969 - present
INSPHYS - INSPHYS - Inspec Phys Supplement Backfile (1979 - 1994

INVESTEXT - INVESTEXT from 1982 to present
IPA - International Pharmaceutical Abstracts 1970-present
IRMAS - International Register Trademarks 1946 to the present
ISMEC - ISMEC - Mechanical Engineering Abstracts
ITRD - International Transport Research Documentation 1972-da
JAPIO - JAPIO - Japanese Patents from 1976 - present
JICST-EPLUS - JICST-EPlus File on Sci. & Tech. in Japan 1985-present
KOSMET - Cosmetic & Perfume Science & Technology 1968-present
LBIBLIO - Bibliodata learning File
LCA - The CA Learning File
LCASREACT - The CAS Reaction Search Service Learning File
LDPCI - Derwent Patents Citation Index Learning File
LDRUG - Derwent Drug Learn File
LEMBASE - The EMBASE Learning File
LIFESCI - CSA Life Sciences Collection from 1978-present
LINSPEC - Learning INSPEC File
LMARPAT - The CAS Patent Markush Learning File
LMEDLINE - The MEDLINE Learning File
LPATDPA - The PATDPA Learning File
LREGISTRY - The Registry Learning File.
LWPI - Derwent World Patents Index Learning File
MARPAT - The CAS Patent Markush File 1988-present
MARPATPREV - Preview File for the CAS Patent Markush File
MATBUS - Materials Business File from 1983-present
MATH - Zentralblatt fuer Mathematik from 1972-present
MATHDI - Zentralblatt fuer Didaktik der Mathematik 1976-present
MDF - Metals Datafile
MEDICONF - Medical Conferences and Events worldwide
MEDLINE - MEDlars onLINE File from 1960 - present
METADEX - METADEX File from 1966-present
MRCK - The Merck Index Online (SM)
MSDS-CCOHS - CCOHS Material Safety Data Sheets
MSDS-OHS - Material Safety Data Sheets - OHS
NAPRALERT - Natural Products Alert Database
NIOSHTIC - NIOSHTIC 1973-present
NLDB - Newsletter Database from 1988 - present
NTIS - U.S.Government Reports Announcements 1964-present
NUMERIGUIDE - Property Hierarchy and Directory for Numeric Files
OCEAN - Oceanic Abstracts from 1964 - current
PAPERCHEM2 - Elsevier Engineering Information, Inc. File 1967 - pre
PASCAL - PASCAL 1984 to the present
PATDD - East German Patents from 1982-present
PATDPA - The German Patent Database from 1968-present
PATIPC - International Patent Classification and Catchword Inde
PATOSDE - German Patents and Utility Models from 1968-present
PATOSEP - Patents of European Patent Office from 1978-present
PATOSWO - PCT Patents from 1983-present
PCTFULL - WIPO/PCT Patents full text
PDLCOM - PDL Chemical & Environmental Compatibility of Plastics
PHAR - Pharmaprojects drug development status file
PHARMAML - Pharma Marketletter 1992 to the present
PHARMASEARCH - IMSworld Pharmaceutical Company Directory
PHIC - Pharmaceutical & Healthcare Industry News (Current)
PHIN - Pharmaceutical & Healthcare Industry Names (Archived)
PIRA - PIRA & PAPERBASE Database from 1975
PLASNEWS - The PLASPEC Daily News File
PLASPEC - Plastics Materials Selection Database
POLLUAB - Pollution Abstracts from 1970-present
PROMT - PROMT from 1978 - present
RAPRA - Rubber, Plastics, Polymer Composites 1972 - present
REGISTRY - The CAS Registry File of substances
RSWB - Regional planning and building construction
RTECS - Registry of Toxic Effects of Chemical Substances
RUSSCI - Russian Scientific News
SCISEARCH - ISI Science Citation Index from 1974 - present

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SIGLE          - Grey Literature in Europe from 1976 - present
SOLIDSTATE     - Solid State and Superconductivity Abstracts from 1981
SOLIS          - German literature in social sciences 1945-present
SPECINFO       - Spectral Database Information System
STANDARDS      - The International Standards Database
STNGUIDE       - Descriptive information about STN databases
STNMAIL        - STN Electronic Mail Service
SWETSCAN       - Swets Table of Contents from 1993 - present
SYNTHLINE      - Synthline Drug Synthesis Database 1984-present
TEXTILETECH    - Textile Technology Digest from 1978 to the present
TIBKAT         - Catalogue of Technical Information Library in Hannover
TOXCENTER      - Toxicology Center from 1907 - present
TRIBO          - TRIBOLOGY INDEX (Friction,Wear,Lubrication) 1972-pres.
TULSA          - Petroleum Abstracts 1965-present
TULSA2         - Petroleum Abstracts 1965-present (Non-subscribers)
UFORDAT        - Environment Research in Progress from 1974 - present
ULIDAT         - Environmental Literature from 1976-present
USAN           - USAN - United States Adopted Names
USPAT2         - U.S. Patents Latest Publications from 2001 - present
USPATFULL      - U.S. Patents Original Publications from 1971 - present
VETB           - Derwent Veterinary Drug File 1968 - 1982
VETU           - Derwent Veterinary Drug File 1983 - 2001
WELDASEARCH    - Weldasearch 1967 to the present
WORLDCAT       - OCLC Union Catalog (of library holdings)
WPIDS          - Derwent World Patents Index 1963 - present (Subscr.)
WPINDEX        - Derwent World Patents Index 1963 - present
WPIX           - DERWENT WPI WITH EXTENSION ABSTRACTS 1963 - PRESENT
WSCA           - World Surface Coatings Abstracts 1976 - present
WTEXTILES      - WORLD TEXTILES 1970 TO THE PRESENT
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ZCAPLUS        - CAPLUS File with zero connect hour pricing
ZREGISTRY      - Zero connect hour REGISTRY

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                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     1.05       1.05

INDEX 'ADISALERTS, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, AQUASCI,
       BIOBUSINESS, BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA,
       CANCERLIT, CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB,
       DDFU, DGENE, DRUGB, DRUGLAUNCH, DRUGMONOG2, ...'
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ANABSTR
AQUASCI
BIOBUSINESS
BIOCOMMERCE
BIOSIS
BIOTECHABS
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BIOTECHNO
CABA
CANCERLIT
CAPLUS
CEABA-VTB
CEN
CIN
CONFSCI
CROPB
CROPU
DDFB
DDFU
DGENE
DRUGB
DRUGLAUNCH
DRUGMONOG2
DRUGNL
DRUGU
DRUGUPDATES
EMBAL
EMBASE
ESBIOBASE
FEDRIP
FOMAD
FOREGE
FROSTI
FSTA
GENBANK
HEALSAFE
IFIPAT
JICST-EPLUS
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LIFESCI
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MEDLINE
NIOSHTIC
NTIS
OCEAN
PASCAL
PHAR
PHARMAML
PHIC
PHIN
PROMT
SCISEARCH
SYNTHLINE
TOXCENTER
USPATFULL
USPAT2

L3 ANSWER 5 OF 28 IFIPAT COPYRIGHT 2002 IFI
TI PUFFED HIGH FIBER R-T-E CEREAL AND METHOD OF PREPARATION; READY TO EAT
AN 2322622 IFIPAT;IFIUDB;IFICDB
TI PUFFED HIGH FIBER R-T-E CEREAL AND METHOD OF PREPARATION; READY TO EAT
INF Creighton, Dean W, Albertville, MN
Efstathiou, John D, Plymouth, MN
IN Creighton Dean W; Efstathiou John D
PAF General Mills, Inc, Minneapolis, MN
PA General Mills Inc (33976)
EXNAM Hunter, Jeanette
EXNAM Mims, Mary S
AG O'Toole, John A
PI US 5176936 19930105 (CITED IN 020 LATER PATENTS)
AI US 1991-696889 19910508
XPD 17 Dec 2010
RLI US 1990-628760 19901217 CONTINUATION-IN-PART
US 1990-628980 19901217 CONTINUATION-IN-PART
FI US 5176936 19930105
DT UTILITY
FS CHEMICAL
FS GRANTED
MRN 006327 MFN: 0372
CLMN 28
GI 1 Drawing Sheet(s), 4 Figure(s).
ACLM 2. The R-T-E cereal of claim 1 wherein the cooked cereal dough comprises: A. about 25 to 80 wt % of a first farinaceous material (dry weight basis), B. about 0.1 to 20 wt % of a nutritive carbohydrate sweetening agent, C. sufficient amounts of a **fiber** source material having a particle size ranging from about 25 to 1000 microns, so as to provide a total **dietary fiber** content of about 2.5 to 12 g/oz, D. about 0.1 to 5 wt % salt, and E. a moisture content of less than about 4 wt %, and wherein the shell has an imperforate exterior surface.
3. The R-T-E cereal of claim 2 wherein the **fiber** source material is selected from the group consisting of cellulose, microcrystalline cellulose, cocoa **bran**, corn **bran**, oat **bran**, oat **fiber**, **apple** pulp, pectin, psyllium, rice **bran**, sugar beet pulp, wheat **bran**, soybean **fiber**, hydrocolloids, pea **fiber**, wheat **fiber** and mixtures thereof.
6. The R-T-E cereal of claim 5 wherein the cooked cereal dough comprises: A. about 25 to 80 wt % of the farinaceous material and wherein the farinaceous material comprises: a) a cereal flour b) a cereal starch B. about 0.1 to 20 wt % of the nutritive carbohydrate sweetening agent, C. about 10 to 50 wt % of the **fiber** source, D. about 0.1 to 5 wt % salt.
11. The R-T-E cereal of claim 9 wherein the shell is seamless and at **least** a portion of which includes corrugations.
13. A method for preparing a high **fiber** puffed R-T-E cereal, comprising the steps of: A. forming a cooked cereal dough comprising 3. sufficient amounts of a **supplemental fiber** material to provide the dough with a total **dietary fiber** content ranging from about 2.5 to 12 g/oz (dry basis) including a soluble **dietary fiber** fraction and an **insoluble dietary fiber** fraction in a weight ratio ranging from about 1:2 to 4,
14. The method of claim 13 wherein the cooked cereal dough comprises A. about 25 to 80 wt % of a first farinaceous material (dry weight basis), B. about 0.1 to 20 wt % of a nutritive carbohydrate sweetening agent, C. sufficient amounts of a **fiber** source material having a particle size ranging from about 25 to 1000 microns, so as to provide a total **dietary fiber** content of about 6 to 9 g/oz, D. about 0.1 to 3 wt % salt, and E. a moisture content of less than about 4 wt %.
15. The method of claim 13 wherein the **fiber** source material is

selected from the group consisting of cellulose, microcrystalline cellulose, cocoa **bran**, corn **bran**, oat **bran**, oat **fiber**, **apple** pulp, pectin, psyllium, rice **bran**, sugar beet pulp, wheat **bran**, soybean **fiber**, hydrocolloids, pea **fiber**, wheat **fiber** and mixtures thereof.

23. A pellet useful for puffing to form a puffed, high **fiber** R-T-E cereal, comprising: a cooked farinaceous dough in the form of a planar parallelogram having a thickness of about 0.5 to 2 mm and a weight ranging from about 0.2 to 0.5 g, said dough comprising: A. about 25 to 80 wt % of a first farinaceous material (dry weight basis), B. about 0.1 to 20 wt % of a nutritive carbohydrate sweetening agent, C. sufficient amounts of a **fiber** source material having a particle size ranging from about 25 to 1000 microns, so as to provide a total **dietary fiber** content of about 6 to 9 g/oz, D. about 0.1 to 3 wt % salt, and E. a moisture content of less than about 4 wt %. said pellet having a case hardened surface.

24. The pellet of claim 23 wherein the **fiber** source has an **insoluble fiber** content to soluble **fiber** content ranging from about 2:1 to 4:1.

25. The pellet of claim 24 wherein the cereal composition comprises: A. about 25 to 80 wt % of a first farinaceous material (dry weight basis), B. about 0.1 to 20 wt % of a nutritive carbohydrate sweetening agent, C. sufficient amounts of a **fiber** source material having a particle size ranging from about 25 to 1000 microns, so as to provide a total **dietary fiber** content of about 2.5 to 12 g/oz, D. about 0.1 to 5 wt % salt, and E. a moisture content of less than about 4 wt %.

26. The pellet of claim 25 wherein the **fiber** source material is selected from the group consisting of cellulose, microcrystalline cellulose, cocoa **bran**, corn **bran**, oat **bran**, oat **fiber**, **apple** pulp, pectin, psyllium, rice **bran**, sugar beet pulp, wheat **bran**, soybean **fiber**, hydrocolloids, pea **fiber**, wheat **fiber** and mixtures thereof.

AB Disclosed are puffed ready-to-eat breakfast cereal products having a high Total Dietary Fiber content which nonetheless exhibit desirable crispness. The cereal products are characterized by specific densities of about 0.075 to 0.35 g/cc. The Total Dietary Fiber content of the cereal compositions is about 2.5-12 g/oz or about 9% to 42%. The total fat content of the puffed cereal is less than about 4%. The cereal base is in the form of a hollow, pillow shaped piece comprising a thin shell surrounding the hollow core. In preferred embodiments, the cereal is provided with a low level of a sugar presweetening coating. Also disclosed are processes for preparing the puffed high fiber R-T-E cereals from pellets in sheet form.

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In a multifile environment, each file must have at least one valid
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=> d ti bib ab hit 8-13

L3 ANSWER 8 OF 28 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 1
TI Serum lipids in hypercholesterolemic men and women consuming oat bran and amaranth products.
AN 2000:272441 BIOSIS
DN PREV200000272441
TI Serum lipids in hypercholesterolemic men and women consuming oat bran and amaranth products.
AU Maier, Susan M.; Turner, Nancy D.; Lupton, Joanne R. (1)
CS (1) Faculty of Nutrition, Texas A and M University, College Station, TX, 77843-2471 USA
SO Cereal Chemistry, (May June, 2000) Vol. 77, No. 3, pp. 297-302. print.. ISSN: 0009-0352.
DT Article
LA English
SL English
AB One hundred-eighty hypercholesterolemic subjects following the National Cholesterol Education Program Step One Diet were randomly divided into six groups (30 +- 2/group). Group 1 served as the control and received no **fiber supplements**. The **fiber supplemented** groups received 50 g/day of oat **bran** or amaranth from various sources: Group 2 (oat **bran** muffins); Group 3 (amaranth muffins); Group 4 (Oat **Bran** O's); Group 5 (Oat **Bran** Flakes); and Group 6 (a variety of oat **bran** products). Fasting serum total cholesterol (FSTC), low density-, very low density-, and high density-lipoprotein cholesterol (LDL-C, VLDL-C, and HDL-C) and serum triacylglycerols were measured before and after the 28-day intervention. Three-day diet records were completed before and after intervention. Subjects reduced ($P < 0.05$) the mean intake of total and saturated fat, and cholesterol. FSTC dropped **more** than twice as much ($P < 0.05$) as was observed with fat modification alone (Group 1 = -0.31 mmol/L), when oat **bran** was provided as flakes (Group 5 = -0.86 mmol/L) or in a variety of forms (Group 6 = -0.75 mmol/L). If the initial ratio of HDL-C to FSTC was low, then **supplementation** did not decrease FSTC to the extent observed when the initial ratio was high. Compliance with the **dietary** interventions was best when the subjects gave the product a rating of ltoreq2.0 (on a 1-4 hedonic scale, with 1 being excellent). We can conclude from these data that **fiber supplementation** to reduce serum cholesterol is most effective in hypercholesterolemic individuals that have a greater proportion of HDL-C. In addition, not all the oat **bran** products evaluated were able to lower cholesterol to the same extent, indicating that the ability of soluble **fiber** to reduce FSTC can be compromised by other **dietary** factors such as **insoluble fiber**.
AB One hundred-eighty hypercholesterolemic subjects following the National Cholesterol Education Program Step One Diet were randomly divided into six groups (30 +- 2/group). Group 1 served as the control and received no **fiber supplements**. The **fiber supplemented** groups received 50 g/day of oat **bran** or amaranth from various sources: Group 2 (oat **bran** muffins); Group 3 (amaranth muffins); Group 4 (Oat **Bran** O's); Group 5 (Oat **Bran** Flakes); and Group 6 (a variety of oat **bran** products). Fasting serum total cholesterol (FSTC), low density-, very low density-, and high density-lipoprotein cholesterol (LDL-C, VLDL-C, and HDL-C) and serum triacylglycerols were measured before and after the 28-day intervention. Three-day diet records were completed before and after intervention. Subjects reduced ($P < 0.05$) the mean intake of total and saturated fat, and cholesterol. FSTC dropped **more** than twice as much ($P < 0.05$) as was observed with fat modification alone (Group 1 = -0.31 mmol/L), when oat **bran** was provided as flakes (Group 5 = -0.86 mmol/L) or in a variety of forms (Group 6 = -0.75 mmol/L). If the

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TI Oligosaccharide supplementing composition - has high content of oligosaccharide, and good stability and edible flavor..

AN 2001-102904 [11] WPIDS

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TI Oligosaccharide supplementing composition - has high content of oligosaccharide, and good stability and edible flavor..

DC D13 D17

IN KISHIMOTO, T; MATSUMOTO, T; OKAMOTO, T; TAKAICHI, A

PA (SAKA) OTSUKA PHARM CO LTD

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PI WO 2001000883 A1 20010104 (200111)* JA 26p
W: CN KR US
JP 2001008666 A 20010116 (200119) 10p
KR 2002015706 A 20020228 (200258)

ADT WO 2001000883 A1 WO 2000-JP3998 20000620; JP 2001008666 A JP 1999-184814 19990630; KR 2002015706 A KR 2001-716684 20011227

PRAI JP 1999-184814 19990630

TECH UPTX: 20010224

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Composition: The composition further comprises 0.1 - 5 wt.% K_2CO_3 as a stabilizer and a 5-20 wt.% water insoluble food fibres. The oligosaccharide is lacto sucrose. The **composition** also contains a sugar selected from 18 specific sugars including e.g. soya sugar, pectin sugar, and gentio-oligo saccharide. The foaming agent is $NaHCO_3$, Na_2CO_3 or $CaCO_3$. The neutralizing agent is succinic acid, L-tartaric acid, L-ascorbic acid or DL-apple acid. The water **insoluble** food **fiber** is crystalline **cellulose**, wheat **bran**, oats **bran**, corn **fiber**, soya **fiber** or bead **fiber**.

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L4: Entry 10 of 11 File: USPT Dec 22, 1992

DOCUMENT-IDENTIFIER: US 5173296 A
TITLE: Compositions containing psyllium

Brief Summary Text (4):
U.S. Pat. No. 4,784,861, to Gori, issued Nov. 15, 1988, describes powders formed of a mixture of oat, wheat and corn bran mixed with pectin, guar gum, psyllium and cutin to which mineral supplements have been added. U.S. Pat. No. 4,619,831, to Sharma, issued Oct. 28, 1986, describes dietary fiber products comprising insoluble dietary fiber (92-98.5%) coated or enrobed with soluble dietary fiber (1.5-8%; psyllium is mentioned as one of many soluble fibers). U.S. Pat. No. 4,565,702, to Morley et al., issued Jan. 21, 1986, describes dietary fiber compositions comprising dietary fibers which are insoluble fibers coated with soluble fiber. U.S. Pat. No. 4,348,379, to Kowalsky et al., issued Sept. 7, 1982, describes dietetic compositions comprising psyllium seed, linseed, and wheat bran. European Patent Application Publication No. 144,644, published Jun. 19, 1985 by G. D. Searle and Co., describes high fiber food compositions comprising psyllium and other dietary fiber sources.

Detailed Description Text (20):
The present compositions also optionally comprise other dietary fiber, preferably insoluble dietary fiber. The term "insoluble dietary fiber", as used herein, means the water insoluble, substantially non-swellable component of fiber material safe for human ingestion which is non-digestible and non-metabolizable by humans.

Detailed Description Text (21):
A wide range of materials containing insoluble dietary fiber may be used in the present invention. Preferred are cereal brans and mixtures thereof, due to their relatively high content of insoluble dietary fiber. Also preferred is that these cereal brans comprise at least about 75% of the insoluble dietary fiber. Brans preferred include those selected from the group consisting of wheat, corn, barley, rye, oats, rice, soybean, beets, and mixtures thereof. Most preferred are oat or corn. The components of the insoluble dietary fiber from these cereal brans are known to be cellulose, hemicellulose and lignin.

Detailed Description Text (22):
Compositions of the present invention containing insoluble dietary fiber typically comprise from about 1% to about 20% of an insoluble dietary fiber, and preferably from about 5% to about 10% insoluble dietary fiber, by weight of the compositions.

US Reference Patent Number (5):
4871557

US Reference Group (5):
4871557 19891000 Linscott 426/93

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L13: Entry 54 of 67 File: USPT Oct 24, 1989

DOCUMENT-IDENTIFIER: US 4876102 A
TITLE: Potato based dough containing highly pectinated cellulosic fibers

Abstract Text (1):
Improved fried food potato-based products are formulated by the addition of certain water absorbent cellulosic fibers (hereinafter "fibrous cellulosic material"), preferably those high in pectin (hereinafter "cellulosic absorbent material"), most preferably Modified Citrus Absorbent Material (hereinafter "MCAM") or sugar beet pulp absorbent material (hereinafter "SAM") to the dough thereof to achieve increased workability of said dough after mixing and storage, and enhanced texture and flavor of said fried foods after frying. In addition, increased retention of crispness after the microwave reheating thereof in a fry-freeze-microwave cycle is accomplished. Most preferred fiber source is the highly pectinated cellulosic fiber MCAM, derived from citrus albedo, and is added to the potato-based dough in an amount approximately equal to 6% by weight.

Brief Summary Text (2):
The field of this invention is improved fried potato products made from dehydrated potato dough to which water-absorbent cellulosic fibers have been added.

Brief Summary Text (4):
This invention relates to fried food products made from potato dough to which certain water absorbent fibers (hereinafter "fibrous cellulosic material"), preferably highly pectinated cellulosic material (hereinafter "cellulosic absorbent material"), most preferably modified citrus absorbent material (hereinafter "MCAM") or sugar beet pulp absorbent material (hereinafter "SAM"), has been added. While citrus fruits are primary sources of high pectin containing cellulosic fibers, other food sources such as apples, apricots, and watermelon rinds are also high in pectin and can also be employed as sources of fiber in the present invention. Although the preferred embodiments of this invention incorporate fibrous cellulosic material high in pectin content, certain other sources of fibrous cellulosic material also may be used successfully and will be disclosed herein.

Brief Summary Text (5):
Several references disclose that the addition of citrus fiber to various food compositions results in certain improvements. For example, U.S. Pat. No. 3,821,449 of Swisher (assigned to Sunkist Growers Inc.), issued June 28, 1974, discloses that the addition of raw fresh citrus peel to cakes yields a natural "bite" feeling in the mouth. Initially, the raw fresh citrus peel is immersed in hot vegetable oil under atmospheric pressure in order to dehydrate the peel. Next, the peel is further dehydrated by vacuum until the peel has a moisture content of 15 percent or less. Finally, the peel material is separated from the oil and then drained.

Brief Summary Text (6):
Similarly, U.S. Pat. No. 3,574,634 to Singer (assigned to Calogics), issued Apr. 13, 1971, and U.S. Pat. No. 4,379,732 to Staub (assigned to General Foods), issued Apr. 12, 1983, disclose the addition of cellulosic materials, such as citrus albedo, in addition to pineapple core bulking agent and sugar beet pulp bulking agent to create low calorie food products such as spaghetti, macaroni, and related pasta products. Also, the inclusion of this fiber in low calorie food compositions high in polysaccharides or polyols is said to alleviate the diarrhea often resulting from ingestion of low calorie food products high in polysaccharides or polyols.

Brief Summary Text (7):
The prior art does not disclose the addition of citrus fiber or other cellulosic fibers to potato-based dough used in the manufacture of fried foods. However, U.S.

Pat. No. 4,219,575 to Saunders et al. (assigned to Amfac Foods, Inc.), issued Aug. 26, 1980, discusses a process for preparing frozen french fried potatoes in order to increase the crispness of finished french fries after microwave reheating. The french fries have an undulating side surface configuration of particular dimensions which is specifically adapted for microwave reheating. In order to increase the crispness of the finished french fries, modified food starch may be added.

Brief Summary Text (8):
It is therefore an object of this invention to create improved fried food products made from a potato-based dough, wherein said dough and the food products made therefrom are improved by the addition of a fibrous cellulosic material, said material having a high water absorbency. The source of the fibrous cellulosic material for use in this invention is preferably high in pectin (i.e., it contains at least 15% pectin), and most preferably citrus peel fiber or sugar beet pulp. However, certain other sources of fibrous cellulosic material can be utilized to achieve a cellulosic material having the requisite water absorbency and can be satisfactorily utilized in the invention disclosed herein.

Brief Summary Text (16):
An improved potato-based dough is disclosed for use in the manufacture of potato-based fried foods. Said improvements are achieved by the addition of water absorbent fibrous cellulosic material, preferably that which is highly pectinated cellulosic material (hereinafter "cellulosic absorbent material"). Most preferred fibrous cellulosic materials are citrus peel fiber in the form of modified citrus absorbent material (MCAM), or sugar beet pulp absorbent material (SAM), most preferably MCAM derived from citrus albedo. Particularly, cellulosic absorbent material is derived from sources of fiber high in pectin and has been modified to increase its oil and water-absorbing capacity. When cellulosic absorbent material is used as the absorbent fibrous cellulosic material, it is added to potato-based dough in the amount of from about 3% to about 20%, preferably from about 3% to about 9%, and most preferably in the amount of about 6%.

Brief Summary Text (17):
Certain other fibrous cellulosic materials have been found suitable for use in this invention, not because they are high in pectin, but because they consist of a water-soluble fibrous component and a water-insoluble fibrous component. This type of fiber is prepared by mixing the water-soluble fibrous component and the water-insoluble fibrous component to achieve a fibrous cellulosic material that is also added to the potato-based dough. When this type of fibrous cellulosic material is utilized, however, it is added to the dough in the amount of from about 3% to about 20%, preferably in the amount of about 6% to about 12%. The two components interact with one another to give the potato-based dough increased pliability and extensibility. The water-soluble fibrous component should preferably consist of xanthan, carageenan, guar, carboxy-methyl cellulose, or any mixture thereof, but other water-soluble fibrous components such as pectin, gum tragacanth, locust bean gum, or any mixture thereof may also be used satisfactorily. The water-insoluble fibrous component may consist of any natural fiber that contains less than 1% soluble fiber, including, for example, oat fiber, pea fiber, soy fiber, oat bran, rice bran, or any mixture thereof. In addition, certain processed cellulosic fibers, such as Avicel.RTM. (FMC Corp., Philadelphia, PA) or Solka Floc.RTM. (James River Corp., Berlin, NH), may also be successfully used as the water-insoluble fibrous component.

Brief Summary Text (20):
The present invention relates to fried food products made from potato-based dough containing certain water absorbent fibrous cellulosic materials, preferably those which are high in pectin content (hereinafter "cellulosic absorbent material"), for example MCAM (modified citrus absorbent material) or SAM (sugar beet pulp absorbent material), most preferably MCAM made from citrus albedo, and the process for making same. By high in pectin content as used herein is meant that the pectin content of the fibrous cellulosic material is at least 15%, preferably from about 15% to about 60%. When the fibrous cellulosic material is chosen from a highly pectinated cellulosic absorbent material, it is added to the potato-based dough in an amount of from about 3% to about 20%, preferably from 3% to about 9%, most preferably about 6%. Certain other water absorbent fibrous cellulosic materials not exhibiting a high

pectin content but consisting of a water-soluble component and a water-insoluble component may also be satisfactorily utilized. When the fibrous cellulosic material consists of a water-soluble component and a water-insoluble component, it is added to the potato-based dough in an amount of from about 3% to about 20%, preferably from about 6% to about 12%. Improved texture and structure formation, as well as increased oil/water retention, is exhibited by the addition of said fibrous cellulosic material to certain fried food formulations.

Brief Summary Text (21):
By "cellulosic fiber," as used herein, is meant a dietary fiber comprised of at least about 20% cellulose or modified cellulosic material. Sources of cellulosic fiber include vegetables, fruits, seeds, cereals, and man-made fibers (for example by bacterial synthesis).

Brief Summary Text (22):
The fibrous cellulosic material used in the practice of the present invention must have a water absorbency of between about 2 g water/g fiber and about 25 g water/g fiber, and preferably between about 8 g water/g fiber and about 20 g water/g fiber. High absorbency is preferred for providing the benefits of this invention. Because of this, various sources of the fibrous cellulosic material may be used. Certain fibrous cellulosic materials, because of a high pectin content, have the requisite water absorbency. On the other hand, other fiber sources, although not high in pectin, can be utilized due to the fact that they possess the requisite water absorbency because they consist of a water-soluble component and a water-insoluble component.

Brief Summary Text (23):
For purposes of this invention, absorbency is measured by the following procedure. A standard heat-sealed tea bag is used, made with tea bag filter paper, Dexter Grade 1234 Tea (C. H. Dexter Corp., Windsor Locks, CT), and measuring 3" by 2-7/16". One-half gram of fiber is placed into an empty tea bag. The bag is immersed for 2 minutes in distilled water at room temperature, then removed and suspended in the air, and allowed to drip dry for 10 minutes. The bag is then weighed. The procedure is repeated using an empty tea bag without fiber. The weight of the wet bag alone is subtracted from the weight of the wet bag containing fiber. This number is divided by the weight of the sample in order to obtain an absorbency value measured as grams water/grams fiber.

Brief Summary Text (24):
Because the water absorbency of the chosen fibrous cellulosic material is crucial to the workability of the present invention, preferred fibrous cellulosic materials are those cellulosic absorbent materials with a relatively high pectin content, since water absorbency is directly increased by increasing pectin content. It is for this reason that the chosen source of cellulosic fiber is preferably composed of from about 15% to about 60% pectin, and from about 15% to about 80% cellulose, in addition to various other fibrous components such as hemicelluloses and lignin. Most preferred ranges are from about 15% to about 50% pectin and from about 30% to about 60% cellulose.

Brief Summary Text (25):
Preferably, the fibrous cellulosic material is selected from high pectin containing sources such as whole citrus peel fiber or citrus albedo fiber or other naturally occurring fibers that contain a composition of pectin and cellulose similar to citrus peel fiber, for example sugar beets, dried citrus pulp, citrus rag, citrus juice vesicle solids, apples, apricots, and watermelon rinds or mixtures thereof. More preferred sources are citrus whole peel or sugar beet pulp, while most preferred is citrus albedo. Mixtures of the above can also be used. These fibers are obtained from their natural sources by processes known to the art and disclosed in the following U.S. patents, all incorporated by reference herein: U.S. Pat No. 2,147,521 to Bustamante (assigned to Florida Citrus Exchange), issued Feb. 14, 1939; U.S. Pat. No. 2,362,014 to Lissauer and Credo (assigned to Citrus Processes), issued Nov. 7, 1944; U.S. Pat. No. 3,821,449 to Swisher (assigned to Sunkist Growers), issued June 28, 1974; U.S. Pat. No. 3,982,003 to Mitchell et al. (assigned to Mars Limited), issued Sept. 21, 1976; U.S. Pat. No. 4,143,172 to Mitchell et al. (assigned to Mars Limited), issued Mar. 6, 1979; U.S. Pat. No. 4,225,628 to Lynn

(assigned to Ben Hill Griffin), issued Sept. 30, 1980; U.S. Pat. No. 4,379,782 to Staub et al. (assigned to general Foods), issued Apr. 12, 1983; U.S. Pat. No. 4,497,838 to Bonnell (assigned to Tropicana Products), issued Feb. 5, 1985; U.S. Pat. No. 4,526,794 to Altomare et al. (assigned to General Foods), issued July, 2, 1985.

Brief Summary Text (26):
MCAM can be made from the entire peel of citrus fruit (hereinafter referred to as "whole peel MCAM"), or from only the albedo portion of the peel, the whitish inner portion of the rind, (hereinafter referred to as "albedo MCAM"). Both whole peel MCAM and albedo MCAM typically contain on the order of about 40% pectin and about 27% cellulose by weight. Citrus whole peel, however, unlike citrus albedo, contains, in addition, lignin, another fibrous cellulosic component.

Brief Summary Text (28):
"Pectin" is defined as the portion of the fiber which is capable of forming methyl esters or binding metals, calculated as polygalacturonic acid. The underlying assumptions are that the pectin does not contain any free acid groups, that all of the pectin is anhydrogalacturonic acid, and that no insoluble alkaline earth metal salts, other than calcium salts, are present. These assumptions have been verified by independent methods to be correct within a reasonable margin of confidence.

Brief Summary Text (30):
It has been discovered that the pectin in the composition of these fiber sources plays an important part in determining the absorbent properties of the material. Although compositions differ among species and within species, more than 60% of the pectin in vegetable material is in the form of the methyl ester. In the case of orange peels, on the order of 20% is present as the calcium salt; the balance is generally in the protonated form, or an alkali metal salt, mostly potassium. The pectin in the cellulosic absorbent materials of the present invention has a degree of esterification of less than 45%. The cellulosic starting material must therefore be subjected to a deesterification step which preferably may be accomplished by alkaline treatment at a pH of from about 8 to about 13, preferably 9.5, for a period of up to 120 minutes. The deesterification process may also be attained by use of an enzyme such as pectin-esterase, an enzyme naturally present in citrus peel.

Brief Summary Text (31):
When these pectin-containing fiber sources are used as the fibrous cellulosic materials, care should be taken that the amount of divalent metal pectates is not substantially increased. In particular, calcium pectates have been found to be detrimental to the absorption properties of the material. Moreover, the calcium pectates once formed cannot be readily converted to other pectic materials like alkali metal salts or pectic acids. In general, the total equivalent percent of divalent metals must be less than 50%. The equivalent percent of calcium is preferably less than 30%. In practical terms this means that calcium hydroxide or calcium carbonate cannot be used for alkaline deesterification. For this reason, it is advisable to use deionized or distilled water when processing the pectin-containing cellulosic absorbent material. However, tap water has been found to not significantly reduce the absorbent properties of the materials, provided the water hardness does not exceed about 7 grains/gallon (corresponding to about 120 ppm CaCO.sub.3) and provided that no excessive amounts of water are used. The term "soft water" as used herein therefore refers to water having a hardness of less than 7 grains/gallon (less than about 120 ppm CaCO.sub.3).

Brief Summary Text (32):
Particularly when citrus waste is used, the highly pectinated fibrous source material may contain complex mixtures of lipids and lipid-like materials, and other non-polymeric organic materials. The absorbent properties of the resulting absorbent material may be greatly enhanced by removing these organic extractable materials. In addition, the removal of these organic extractable materials may render a final product with improved aesthetic properties, free of undesirable color or aroma. If desired, these materials may be satisfactorily removed with an organic solvent, most preferably with ethanol.

Brief Summary Text (33):

Hence, the present invention preferably relates to a potato-based fried food product containing cellulosic absorbent materials comprising (a) from about 15% to about 60% pectin, said pectin having a degree of esterification of from about 1% to about 45%, and less than about 50% of the pectin being in the form of a divalent metal salt; (b) from about 15% to about 80% of a material selected from the group consisting of cellulose, hemicellulose, lignin and mixtures thereof; (c) from 0% to about 1% organic solvent-soluble lipids, extractable with an organic solvent such as ethanol; (d) from 0% to about 10% non-lipid organic materials extractable in an organic solvent, such as ethanol; and (e) from 0% to about 6% water-soluble metal salts.

Brief Summary Text (34):
The second major component of the high-pectin containing cellulosic absorbent material, next to pectin, is the cellulosic component. The balance of the fibrous cellulosic material consists of hemicellulose and lignin. The actual composition of the high pectin containing fibrous cellulosic material is to a large extent determined by the choice of the raw material source of the fibers, and to a lesser extent by the process of obtaining the fibers from the source. For example, hemicellulose is likely to be partially removed during processing, which increases the relative amounts of cellulose and lignin in the mixture. Depending on the raw material source, the amount of lignin may be very small. For example, citrus whole peel has a much greater amount of lignin than citrus albedo, while, in general, citrus waste has a much lower lignin level than beet pulp. Despite this difference, however, excellent water absorbent fibrous cellulosic materials can be prepared from either source.

Brief Summary Text (35):
It has been discovered that divalent metal pectates, in particular calcium pectates, are far inferior to alkali metal pectates (e.g. sodium pectates) with regard to absorbent properties. This is probably due to the fact that divalent metal salts of pectin are "cross-linked", whereby the divalent metal ion serves as the link between two adjacent pectin molecules. This cross-linking is believed to prevent swelling of the pectin and to thereby reduce its absorbency. Some of the pectin is naturally present as the calcium salt. Care must be taken not to increase the amount of calcium pectate any further. Therefore, during processing, the materials should not be exposed to excessive amounts of calcium. If calcium is present in the form of an insoluble mineral salt which is not capable of interacting with the esterified pectin, the presence of calcium is probably not harmful at all.

Brief Summary Text (36):
One specific embodiment of this invention utilizes a citrus peel-derived high pectin-containing cellulosic absorbent materials comprising: (a) from about 15% to about 60% pectin, said pectin having a degree of esterification of less than about 20%, and less than about 30% of the pectin being in the form of a divalent metal salt; (b) from about 30% to about 60% of a mixture of cellulose and hemicellulose; (c) from 0% to about 1% organic solvent-soluble lipids, extractable with an organic solvent such as ethanol; (d) from 0% to about 10% non-lipid organic materials, extractable in an organic solvent such as ethanol; and (e) from 0% to about 6% water-soluble metal salts. Preferably, the peels of ripe oranges or grapefruits are used as a starting material and the process is carried out in such a way as to avoid the excessive removal of hemicellulose, which occurs if the pectin undergoes acid deesterification, or if during deesterification the pH is allowed to remain excessively high.

Brief Summary Text (37):
In a second specific embodiment of this invention the high pectin-containing cellulosic absorbent material used in the potato-based fried food products is sugar beet-derived absorbent material comprising: (a) from about 15% to about 35% pectin, said pectin having a degree of esterification of less than about 45% (preferably less than about 20%), and less than about 30% of the pectin being in the form of a divalent metal salt; (b) from about 20% to about 80% of a mixture of cellulose and hemicellulose; (c) from 0% to about 1% organic solvent-soluble lipids, extractable in an organic solvent such as ethanol; (d) from 0% to about 10% non-lipid organic materials, extractable in an organic solvent such as ethanol; and (e) from 0% to about 6% water-soluble metal salts.

Brief Summary Text (39):
The manner in which the deesterification of pectin may be carried out is not critical and may, for example, be enzymatic or chemical. Chemical deesterification of pectin may be carried out at acid or alkaline pH. Acid deesterification is not preferred as it is slow and leads to both divalent ion extraction and hemicellulose degradation. Alkaline deesterification is preferred but care must be exercised. Pectin methyl ester can degrade via a beta-elimination mechanism, so pH and temperature should be carefully controlled. Enzymatic deesterification may be carried out with the enzyme pectinesterase; this is particularly convenient when citrus peels are used as starting material because the enzyme pectinesterase is naturally present in citrus peels. Alternatively, deesterification may be carried out by soaking the vegetable material particles in a solution of an alkali metal hydroxide. The reaction rate increases with the concentration of hydroxyl ions, therefore, the higher the pH, the faster the reaction will be. The pH should therefore be above about 8, preferably above about 9. Excessively high pH values tend to result in removal of hemicellulose and other desirable materials. Therefore, the pH should not exceed about 13, and should preferably be below about 12. While a degree of esterification of less than 45% is generally achieved after about 2 minutes at pH 9.5 or greater, it is generally desirable to maintain the pH at 9.5 for 20 minutes to insure satisfactory results. As beta-elimination is very temperature dependent, a temperature of about 25.degree. C. or lower is preferred. Prolonged contacting of the vegetable material with the alkali hydroxide solution results in a progressively lower degree of esterification of the pectin. It is generally not necessary to continue this deesterification step for more than about 2 hours, since little additional benefit is obtained by doing so.

Brief Summary Text (40):
When the source of the fibrous cellulosic material is a pectin-containing fiber, the washing of the material is critical since it is necessary to remove the alkaline material and excess soluble materials. Washing may be done with water or with an organic solvent such as ethanol. The latter has the advantage that organic solvent-soluble lipids which may be present in the material are generally to some extent removed by an organic solvent like ethanol, but not by a water wash. The washing step may be conveniently carried out as follows. Excess liquid is drained off from the reaction mixture of the deesterification step. Then, enough of the washing liquid (i.e. water or an organic solvent such as ethanol) is added in order to obtain a slurry with a solids content of about 2%. The slurry is equilibrated for about 5 to 15 minutes, and then the washing liquid is drained off. This washing step may be repeated. The number of washing steps is determined by the amount of contaminants in the starting material and the desired composition of the finished absorbent material. Typically, 2 or 3 washing steps will be necessary.

Brief Summary Text (44):
Depending upon the desired nature and appearance of the final food product to which the pectin-containing cellulosic absorbent material is added, bleaching said material may be desired. However, the effect of bleaching is two-fold. It removes color materials, thereby vastly improving the appearance of the absorbent material obtained, and making said material more suitable for use in consumer products where a darkened appearance is not acceptable. Bleaching further tends to decompose organic solvent-soluble lipids into water-soluble fragments. Consequently, the bleaching step significantly reduces the level of organic solvent-soluble materials in the finished product.

Brief Summary Text (45):
The removal of organic solvent-soluble lipids is particularly important when citrus peels are used as the starting material. Citrus peels contain high levels of such organic solvent-soluble lipids and if water (as opposed to an organic solvent such as ethanol) is used in the washing steps of the process, bleaching is instrumental in reducing the level of organic solvent-soluble lipids to the desired level.

Brief Summary Text (46):
Should a bleaching step be desired, the bleaching is preferably performed with the addition of an oxidative bleaching agent. For optimum properties of the cellulosic absorbent material, and optimum safety of absorbent products made therewith, excess bleach and electrolytes introduced during the bleaching step must be removed by

washing steps and food grade bleaching agents must be used. Therefore, hydrogen peroxide is a preferred bleaching agent. Bleaching may be carried out prior to the initial washing steps, or additional washing steps may be performed subsequent to the bleaching. Since color compounds may be formed during alkaline deesterification, the bleaching step is best carried out subsequent to the deesterification step if alkaline deesterification is used. In order to improve the effective use of the bleaching agent, it is desirable to include a washing step subsequent to the deesterification step and prior to the bleaching step, especially when citrus peels are used as the source material.

Brief Summary Text (47):
Although whole citrus peel may be used as the starting material, the flavedo part greatly increases the load of organic solvent-soluble lipids and colored materials. It is therefore most desirable to remove the flavedo part of the peel. The flavedo may be shaved off mechanically by machinery which is commercially available and designed for this purpose. Such equipment typically leaves about 30% of the flavedo on the albedo. It has been discovered that when these machine shaved peels are subjected to the process described hereinabove, an absorbent material is obtained which is negligibly less absorbent than the material obtained from a (handshaved) all-albedo starting material. Whole citrus peels may also be used as starting material. Highly acceptable cellulosic absorbent materials may be made therefrom, albeit at the expense of a higher usage of bleaching chemicals should removal of the increased amount of organic solvent-soluble lipids and colored materials be desired.

Brief Summary Text (48):
Sugar beets, by their nature, contain only low levels of organic solvent-soluble lipids. When processing sugar beet pulp, one may therefore forego the bleaching step if absorbent properties are the only concern. However, during alkaline deesterification, beet pulp develops a persistent green color and a bleaching step may be highly desirable or even necessary from an aesthetics viewpoint.

Brief Summary Text (49):
The processing of other pectin-containing raw materials will have become apparent from the foregoing. The bleaching step may be foregone if the starting material has a low organic solvent-soluble lipid content, contains little colored materials, or if the aesthetics of the absorbent material are relatively unimportant (e.g. when intended for industrial use). The choice of the method of deesterification (enzymatic or alkaline treatment) is largely determined by economic determinations: enzymatic deesterification is relatively slow while alkaline treatment is faster and lends itself better to a continuous operation of the process. The choice of the washing liquid (water or an organic solvent such as ethanol) is likewise determined by economic considerations with which a person skilled in chemical engineering may be deemed well familiar.

Brief Summary Text (50):
While high-pectin containing fibers are preferred, sources of fibrous cellulosic materials for use in the preparation of the improved potato-based dough of the present invention, certain other fiber sources can also be satisfactorily employed as the fibrous cellulosic material therein because, due to the fact that they are comprised of both a water-soluble component and a water-insoluble component, they too have the requisite water absorbency that renders them suitable for use in the potato-based dough as well. Since this type of fibrous cellulosic material consists of two separate and distinct fibrous components, one water-soluble and one water-insoluble, the interaction of these two components with each other renders the dough to which they are added more workable and pliable.

Brief Summary Text (51):
This particular fibrous cellulosic material is prepared by mixing a water-soluble fibrous component with a water-insoluble fibrous component. The water-soluble fibrous component serves to increase the extensibility of the potato-based fiber dough, a function of the dough's viscoelastic and plastic properties. In addition, the water-soluble fibrous component allows the dough to trap and hold an increased amount of air during mixing which results in increased expansion of the dough during frying. Finally, the water-soluble fibrous component stabilizes the air/aqueous

interface during the mixing and frying of the dough while maintaining a series of finely dispersed entrained air bubbles in the dough which form an expanded cellular structure upon frying. This expansion is greatest when the water-soluble fibrous components, and mixtures thereof, that form liquid crystals are used; the liquid crystal-forming water-soluble components are, therefore, the preferred water-soluble fibrous components. Among the liquid crystal forming water-soluble fibrous components are xanthan, carageenan, guar, and carboxy-methyl cellulose. Other water-soluble components, for example pectin, gum tragacanth, locust bean gum, and mixtures thereof, also can be used satisfactorily.

Brief Summary Text (52):
The water-insoluble fibrous component provides solid dispersed particles which provide a physical strengthening of the dough structure. In addition, the water-insoluble component aids in expanding the dough structure by increasing the viscosity of the dough by allowing more air to be entrained therein. Finally, the water-insoluble component aids the water-soluble component in cellular expansion by stabilizing the air/aqueous interface of the air bubbles. Water-insoluble fibrous components include natural fibers that contain less than 1% soluble fiber. Preferred water-insoluble fibrous components consist of, but are not limited to, oat fiber, pea fiber, oat bran, and rice bran. However, certain processed cellulosic fibers such as Avicel.RTM. (FMC Corp., Philadelphia, PA) and Solka Floc.RTM. (James River Corp., Berlin, NH) may also be used successfully as water-insoluble fibrous components, providing the fiber's length/diameter (l/d) ratio is preferably less than about 10.

Brief Summary Text (53):
This type of fibrous cellulosic material is generally preferably prepared by dry mixing the water-soluble fibrous component with the water-insoluble fibrous component. The fibrous cellulosic material should contain approximately 0.5% to approximately 25% of the water-soluble fibrous component, with the remainder consisting of the water-insoluble fibrous component. It is sometimes desirable, however, to prehydrate the water-soluble fibrous component by adding all or part of the water of the dough mixture before combining with the water-insoluble component. The amount of water necessary to prehydrate the water-soluble component depends upon the particular fiber source being used and its respective ability to absorb water and is easily discernible by one skilled in the art.

Brief Summary Text (54):
Because the water-soluble and the water-insoluble components of the fibrous cellulosic material interact with one another in the potato-based fiber dough system, a synergistic effect exists when certain processed water-insoluble fibrous components that contain a certain level of their own water-soluble fiber are used. Examples of fibrous cellulosic materials that contain water-insoluble fibers are made up of a significant amount of an inherent water-soluble fiber are Dietfiber Soy Fiber.RTM. (Lauhoff Green Co., Danville, IL), Fibrim Soy Fiber1000.RTM. (Protein Technology, St. Louis, MO), and Hi-Fi Lite Pea Fiber.RTM. and Uptake 80 Pea Fiber.RTM. (both from Woodstone Foods, Portage La-Prairie, Manitoba, Canada). When these water-insoluble fibrous components are used, their own inherent water-soluble fibrous portion joins the water-soluble component and yields a synergistic effect on increasing cellular expansion and structural strength of the fiber dough system, similar to that attained by adding the water-soluble fibrous component to the water-insoluble fibrous component to create the fibrous cellulosic material as previously described.

Brief Summary Text (55):
The fibrous cellulosic material should preferably also have a particle size such that at least about 80% of the fiber particles have a diameter less than about 300 microns, and more preferably less than about 200 microns. In addition, the length/diameter (l/d) ratio of the fibrous cellulosic material should preferably be less than about 10. Larger particles are detected as gritty during mastication and are objectionable. The larger particles are also more difficult to disperse in the product. The fiber should preferably also have a reasonably bland taste and color so as not to negatively influence the taste or appearance of the finished fried-food product.

Brief Summary Text (67):
The above described dough is prepared by first creating the potato component by a process mentioned above. Next, a mixture is prepared by mixing 20% to 50%, preferably about 37%, by weight of said potato component with about 25% to 55%, preferably 21%, by weight of warm tap water. After the potato component and water have been mixed using the above-described method, between about 3% and about 20% fibrous cellulosic material is mixed with the remaining warm tap water and the resulting mixture is combined with the potato component and water mixture to make a dough. If the chosen fibrous cellulosic material is a highly pectinated cellulosic absorbent material, it is added to the potato-based dough in an amount from about 3% to about 20%, preferably from 3% to about 9%, most preferably about 6%. If the fibrous cellulosic material consists of a water-soluble component and a water-insoluble component, it is added to the potato-based dough in an amount of from about 3% to about 20%, preferably from about 6% to about 12%. The resulting dough mixture is mixed in a Simac 700 Pasta Mixer until it is uniform.

Brief Summary Text (68):
The addition of the fibrous cellulosic material to the dough causes a certain level of "conditioning" which allows the modified dough to retain a workable rheology after mixing and short storage. In the typical dehydrated potato dough, the hydration of the fiber immediately begins to stiffen the dough, reducing the time required for the working and extruding of the dough.

Detailed Description Text (2):
Preparation of Citrus Albedo

Detailed Description Text (3):
Modified Citrus Absorbent Material (MCAM)

Detailed Description Text (4):
2000 grams of citrus albedo is obtained by shaving the flavedo portion away from the citrus whole peel. The remaining albedo is then ground to a particle size of 200 microns upon being subjected to a hammermill and an urschel grinder with a 188 slot head. Next, the 2000 grams of albedo is washed in 16,000 grams of soft or distilled water in slurry form consisting of 2.5% albedo solids. The slurry is then deesterified upon being hydrolyzed by titration with 1N NaOH to pH 9.5. The solution is held at pH 9.5 for a period of 20 minutes by the addition of additional 1N NaOH when necessary. Next, the slurry is dewatered in a basket centrifuge and then washed with water while spinning in the centrifuge. The filter cake is bleached by being slurried with hydrogen peroxide in concentration of 2.0% solids, until a pH of 9.5 is obtained. The pH of 9.5 is maintained for 20 minutes by the addition of additional hydrogen peroxide. The bleached filter cake slurry is then dewatered in a basket centrifuge and then washed with water while spinning in the centrifuge. Finally, the bleached filter cake is dried. The resulting citrus albedo MCAM has a water absorbency of 10 g water/g fiber.

Detailed Description Text (6):
Potato based dough is created by first mixing 37% by weight of potato flakes with 21% by weight of warm tap water in a Hobart, vertical planetary paddle mixer until the water is evenly dispersed throughout the dough and the potatoes have been uniformly rehydrated to the extent possible by the amount of water present. Next, 6% by weight of citrus albedo MCAM from Example I is mixed with 36% by weight warm tap water and added to the potato-water mixture. The resulting dough is mixed in a Simac 700 Past Mixer until it is uniform. Next, the dough is passed through a rigitoni die and extruded into rods 1/2 inch in diameter and 2 inches in length. Said rods of dough are deep-fat fried in hot oil at 375.degree. F. for 5 minutes and are ready to eat.

CLAIMS:

1. An improved potato based dough comprising:

(a) 20% to 50% potato component based on dried potato weight, wherein said potato component has been adjusted to a reducing sugar content of from 0% to about 5%; an iodine index of from about 0.1 to about 6; and a lipid content defined by the

relationship Y=AX.sup.0.40, where Y is the lipid content of the dough in percent by weight of dehydrated potatoes, A has a value less than or equal to 2.70, and X is the dehydrated potato iodine index which ranges from about 0.01 to about 6; and

(b) 25% to 55% water; wherein said improvement comprises the including in said dough of from about 3% to about 20% of a fibrous cellulosic material, said cellulosic material having a water absorbency of between about 2 g water/g fiber and 25 g water/g fiber and having a pectin content of at least about 15%, said cellulosic material being derived from citrus whole peel, citrus albedo, citrus juice vesicle solids, citrus rag, dried citrus pulp, sugar beet pulp, apples, or mixtures thereof.

6. A dough according to claim 5 wherein the fibrous cellulosic material is derived from citrus whole peel.

8. A dough according to claim 5 wherein the fibrous cellulosic material is derived from citrus albedo.

10. An improved potato based dough comprising:

(a) 20% to 50% potato component based on dried potato weight, wherein said potato component has been adjusted to a reducing sugar content of from 0% to about5%; an iodine index of from about 0.01 to about 6; and a lipid content defined by the relationship Y=AX.sup.0.40, where Y is the lipid content of the dough in percent by weight of dehydrated potatoes, A has a value less than or equal to 2.70, and X is the dehydrated potato iodine index which ranges from about 0.01 to about 6; and

(b) 25% to 55% water; wherein said improvement comprises the including in said dough of from about 3% to about 20% of a fibrous cellulosic material, said cellulosic material having a water absorbency of between about 2 g water/g fiber and 25 g water/g fiber, wherein the fibrous cellulosic material is a mixture of a water-soluble fibrous component and a water-insoluble fibrous component.

12. A dough according to claim 11 wherein the fibrous cellulosic material consists essentially of from about 0.5% to about 25% of the water-soluble fibrous component, the remainder consisting essentially of the water-insoluble fibrous component.

14. A dough according to claim 13 wherein the water-soluble fibrous component is selected from the group consisting of xanthan, carboxy-methyl cellulose, carageenan, guar, pectin, tragacanth gum, and locust bean gum, and mixtures thereof.

15. A dough according to claim 14 wherein the water-insoluble fibrous component is a natural fiber containing less than 1% of water-soluble fiber.

16. A dough according to claim 15 wherein the water-insoluble fibrous component is selected from the group consisting of oat fiber, pea fiber, soy fiber, oat bran, rice bran, and mixtures thereof.

17. A dough according to claim 16 wherein the water-soluble fibrous component is dry mixed with the water-insoluble fibrous component.

18. A dough according to claim 16 wherein the water-soluble fibrous component is prehydrated with all or part of the water of the dough mixture before mixing with the water-insoluble fibrous component.

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Search Results - Record(s) 1 through 2 of 2 returned.

☐ 1. 5336515 . 15 Dec 92; 09 Aug 94. Polysaccharide hydrocolloid-containing food products. Murphy; Gregory B., et al. 426/573; 426/506 426/549 426/572 426/574 426/575 426/578 426/618 426/656. A23L001/0534 A23L001/054.

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L21: Entry 1 of 2 File: USPT Aug 9, 1994

US-PAT-NO: 5336515
DOCUMENT-IDENTIFIER: US 5336515 A

TITLE: Polysaccharide hydrocolloid-containing food products

DATE-ISSUED: August 9, 1994

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DISCLAIMER DATE: 20090728

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DATE FILED: December 15, 1992

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This application is a continuation-in-part of Ser. No. 366,902, filed Jun. 15, 1989 and now abandoned.

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US-CL-CURRENT: 426/573; 426/506, 426/549, 426/572, 426/574, 426/575, 426/578, 426/618, 426/656

FIELD-OF-SEARCH: 426/549, 426/572, 426/573, 426/574, 426/575, 426/578, 426/618, 426/656, 426/506

PRIOR-ART-DISCLOSED:

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Search Selected | Search ALL

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ART-UNIT: 132

PRIMARY-EXAMINER: Pratt; Helen

ABSTRACT:

Food products, typically having a moisture content above 50% by weight, are prepared which contain polysaccharide hydrocolloid and insoluble fiber at a weight ratio of 1:0.2-3.5:1.1-4.5. These materials are preferably added to the food product as an aqueous dispersion. The aqueous dispersion preferably also contains a protein material. This invention is particularly useful in the preparation of fat-free food products.

14 Claims, 0 Drawing figures
Exemplary Claim Number: 1

BRIEF SUMMARY:

1 TECHNICAL FIELD

2 Our invention relates to the production of reduced-fat and polysaccharide hydrocolloid-containing fluid or high-moisture food products such as salad dressings, ice cream, icings, meats and the like.

3 The reduction of dietary fat consumption is of concern to a great many consumers, such as dieters seeking to reduce their caloric intake and health-conscious consumers wishing to reduce the amount of calories consumed from fat. Thus, commercially-acceptable ways to reduce or eliminate fat from various food products are much sought after.

4 BACKGROUND ART

5 Many prior art disclosures recite the-incorporation of materials such as gums, cellulosic fiber or protein into food products in a manner to either partially or fully replace fat. Among such prior art disclosures are U.S. Pat. Nos. 4,143,163 to Hutchinson et al.; 4,308,294 to Rispoli et al.; 4,734,287 to Singer et al.; and published EPO application 340,035 and published PCT application 89/01813 both to Chen et al.

6 DISCLOSURE OF THE INVENTION

7 The present invention is directed to the use of hydrated, polysaccharide hydrocolloids in combination with insoluble fiber and, if desired, protein material, in order to improve the functional and/or organoleptic attributes of reduced-fat and fat-free products.

8 The use of hydrated, polysaccharide hydrocolloids, together with hydrated insoluble fiber and, as desired, hydrated protein material, as taught in this invention, will find utility in a wide variety of food products to eliminate or reduce fat content. It is believed that the hydrated, polysaccharide hydrocolloids, with added insoluble fiber and, as desired, protein material, function as an efficient water binding material which provides a lubricity and mouthfeel to the product which resembles that normally provided by fat. It is also thought that the insoluble fiber will disrupt the gummy texture which polysaccharides hydrocolloids can impart to fluid or high-moisture foodstuffs.

9 The polysaccharide hydrocolloids and insoluble fiber, along with any protein material may be incorporated into the food product in a hydrated state, typically as a preformed aqueous dispersion. It would be possible, however, to add unhydrated polysaccharide hydrocolloids and/or insoluble fiber and/or any protein directly to the food product formulation, provided enough water is present and enough time is allowed to permit hydration of the hydrocolloids, insoluble fiber and protein before the product is used. When added in the form

of an aqueous dispersion, the dispersion should have a thick, paste-like consistency and a viscosity of at least 6, preferably at least 8 and most preferably at least 12, as measured at 40.degree. F. using a Brookfield Model HAT Viscometer with a helipath stand and a size-D, T-Bar spindle at 5 RPMs scale (0-100). The aqueous dispersion should also have a solids content, based on the amount of polysaccharide hydrocolloid, insoluble fiber, protein and water components present in the dispersion of from 2 to 35% by weight, preferably from 5 to 30% and most preferably from 9 to 25%. The solids content of the dispersion will be adjusted based primarily on obtaining a viscosity which is easy to handle and incorporate into the food product, as well as the amount of water which may be added to the food product.

10 The polysaccharide hydrocolloids used in this invention are preferably non-gelling gums, such as xanthan, guar, CMC (carboxymethyl cellulose) and the like. Gums which form gels, such as alginates, pectin, kappa and iota carrageenan and the like are not preferred for use in this invention. Non-polysaccharide hydrocolloids, such as gelatin, have not been found to be suitable for use in this invention.

11 A combination of an anionic polysaccharide hydrocolloid and a galactomannan polysaccharide hydrocolloid has been found to be preferred for use in this invention. The anionic polysaccharide will preferably include within its molecular structure dependent carboxylic acid groups. Xanthan gum and carboxymethyl cellulose are such polysaccharides. Galatomannans are polysaccharide composed solely of mannose and galactose. Guar gum, a galactomannan which has a mannose-to-galactose ratio of about 1.8:1 has proven to be well-suited for use in this invention.

12 Combinations of xanthan gum and guar gum at a weight ratio of 1:4 to 4:1, preferably 1:3 to 3:1 and most preferably about 1:1, have been found to be highly-preferred for use in this invention. Xanthan gum is a high molecular weight polysaccharide which is obtained by pure culture fermentation of glucose with a bacterium of the genus Xanthamonas, such as Xanthomones campestris. Xanthan is a heteropolysaccharide made up of building blocks of D-glucose, D-mannose and D-glucuronic acid. Guar gum is isolated from the seeds of the guar bean (Cyamposis Tetragonaolobas L. taub.) which is native to India and Pakistan.

13 The insoluble fiber which may be employed in this invention can be any edible fiber material, including powdered cellulose (at least 95% insoluble fiber). Fiber derived from cereal grains (e.g., oat, wheat, corn, soy, etc.) is well-suited for use in this invention. Oat fiber, which contains a relatively-high level (at least 85%) of insoluble fiber, soy fiber and wheat fiber have been successfully used in the practice of this invention. The particles of fiber in the aqueous dispersions of this invention may have an average particle size of between about 10 and 200 microns, preferably between 10 and 100 microns. The size of the fiber particles will be a function of the particle size of the selected raw material and the amount of fiber particle fracture resulting from the mixing and/or homogenization employed to produce any aqueous dispersion.

14 The protein material which can be used in this invention may be an essentially-pure protein, as in the case of whey protein or casein, or as part of a protein containing material, such as dry non-fat milk solids, dried egg whites, soy protein, wheat protein, wheat gluten, etc. Non-fat milk solids (about 36% protein) have been found to be useful in this invention. Proteins, such as casein, which form protein micelles in an aqueous dispersion should also be suitable for use in this invention. The protein may be at least partially denatured as denatured protein has higher water absorption properties than undenatured protein.

15 Any aqueous dispersion used in the practice of this invention, may contain additional ingredients such as dispersing agents (e.g. sugars and/or maltodextrin), free-flow agents, preservative systems (e.g. potassium sorbate), flavor systems, coloring agents, etc. Emulsifiers are not needed in the aqueous

dispersions of this invention; however, if included emulsifiers would be present at a level below that of the polysaccharide hydrocolloids. The pH of the dispersion should be maintained above about 5.0 in order to avoid adverse effects upon any protein component. In any dispersion produced, according to this invention, the components of the aqueous dispersion do not form a complex. Although not preferred, the components could be hydrated separately and three dispersions added to the food product formulation. The materials of this invention are thus unlike the gum-protein complexes described in the aforementioned Chen et al. disclosures.

16 This invention has been found to be useful in the production of salad dressings, such as, but not limited to mayonnaise, Italian, French and Russian, frozen confections, such as ice cream, ice milk, frozen yogurt and the like, sauces, gravies, peanut butter, meat products, such as hamburger, hot dogs, sausage and the like, soups, fillings and toppings. This invention is readily used in connection with foodstuffs which have a moisture content above 45%, typically above 50%. It may be desirable to modify existing food product formulations and processes in order to optimize the use of our invention, but this can be done on a product-by-product basis, as desired, by skilled food technologists.

17 It would also be possible to dry, such as by freeze drying, any hydrocolloid-containing dispersions desired for use according to this invention. This dried material could then be hydrated prior to being incorporated into a dough or batter formulation.

18 All percents and ratios used throughout this disclosure are by weight and based on the dry weight of the hydrated hydrocolloid polysaccharide, insoluble fiber and/or protein. Thus, if a fiber material contains both soluble and insoluble constitutents, only the weight of insoluble fiber is considered. Likewise, if a protein material, such as milk solids or vegetable protein concentrates, contain non-protein components, only the weight of the protein is considered.

19 According to this invention, the fatty material contained in food product formulations can be substantially eliminated or reduced. As a substitute for fat the polysaccharide hydrocolloid-insoluble fiber materials of this invention are typically able to replace fat at a rate of about one part hydrocolloid for each 40 to 60 parts of fat. If an aqueous dispersion is used, the dispersion is typically prepared so that the substitution of the dispersion for fat will be at a ratio of 0.5-1.5 to 1, typically about 1 to 1.

20 As used herein, fat-free or substantially fat-free is meant that the food product formulation is free of overtly added fat materials, such as vegetable fats and oils. Low amounts of fat that would naturally be present from other ingredients, such as monoglycerides, which could be present in the formulation as emulsifiers, are not to be excluded by the term fat-free. Food products which have a fat content of less than 0.5 grams per serving are considered to be included in the term "fat-free".

21 According to this invention, the polysaccharide hydrocolloids are included in the food product formulations at a level of from 0.05 to 2.0, preferably 0.05 to 1.0, parts per 100 parts of water. The insoluble fiber is present in the formulation at a level of 0.05 to 2.0, preferably 0.05 to 1.0, per 100 parts of water. The ratio of polysaccharide hydrocolloid to insoluble fiber should be from 1:0.2-3.5, preferably 1:0.8-3.0. The preferred ratio of hydrocolloid to any protein in the dispersion would be from 1:1.1-4.5.

22 A benefit derived from the use of a prepared aqueous dispersion is that any of the materials contained therein can be hydrated at a location or time remote from the production of the foodstuff. In this manner existing processes do not have to be modified.

23 According to a specific embodiment of this invention, aqueous dispersions are prepared which contain polysaccharide hydrocolloid, insoluble fiber and protein at a weight ratio of 1:0.2-3.5:1.1-4.5, preferably 1:0.8-3.0:1.5-3.5 and most

preferably 1:1.5-2.0:2.0-3.0.

24 The process for preparing any aqueous dispersion used in connection with this invention may be any technique which both hydrates the ingredients and produces a uniform distribution of solids within a stable aqueous dispersion. The process may be accomplished in a one, two or more step operation. Most typically, however, a procedure is followed in which the dry ingredients are first combined in a batch-type mixer and the resulting mix is passed through a mixing unit which will produce a uniform aqueous dispersion, such as a homogenizer or a continuous mixer. Thereafter, the dispersion should be pasteurized such as by heating to above about 160.degree. F. (71.1.degree. C.) for up to ten minutes. The dispersion is preferably maintained at 40.degree. F. (4.4.degree. C.) or below in order to ensure microbial stability.

DETAILED DESCRIPTION:

1 EXAMPLE 1

2 An aqueous dispersion was produced with the following composition:

Ingredient	(Weight %)
Water	79.7
Xanthan gum	1.0
Guar gum	1.0
Dextrose	2.3
Oat fiber (88.4% insoluble fiber)	3.6
Milk solids non-fat (36% protein)	12.4

3 The dispersion was prepared by thoroughly blending all the dry ingredients and then, using a Hobart.TM.A-200 mixer with a 20-quart bowl and a wire whip, mixing all of the ingredients for 30 seconds on 2nd speed. This pre-mix was then passed through a Gaulin.TM. laboratory homogenizer (14M-8TA) at 1500 psi 1st stage and 500 psi 2nd stage. The resulting product was a smooth aqueous dispersion with a moisture content of 81.5% and a pH of 6.7.

4 EXAMPLE 2

5 A fluid, cheese filling containing about 65% moisture and suitable for use in non-fat baked goods was prepared with the following ingredients:

Ingredient	(Weight %)
Baker's Cheese Curd (75-80% Water)	50.00
Sugar	15.00
Instant Starch	3.00
Salt	0.60
Emulsifier	2.50
Aqueous Dispersion (Example 1)	15.50
Flavor	0.78
Water	12.50

Preservative	0.06
Xanthan Gum	0.06

6 The sugar, starch, salt, preservative and xanthan gum ingredients were pre-blended using a Hobart.TM. A-200 mixer with a 12-quart bowl and a paddle. The cheese, pre-blend and flavors were then mixed, the aqueous dispersion and water was added and mixing was continued to obtain a smooth consistency. The resulting mixture was an acceptable cheese filling for baked goods and could be substituted for a conventional cheese filling containing about 12% fat.

7 EXAMPLE 3

8 A fat-free Italian salad dressing containing 79% moisture was made according to the following recipe. Thirty grams of water were added to a cruet followed by 56.8 grams of cider vinegar, a packet (19.8 grams) of Good Seasons.RTM. brand Italian salad-dressing mix and 30 grams of the aqueous dispersion of Example 1. The contents of the cruet were then hand-shaken vigoriously. Additional water (about 110 grams) was added to fill the cruet to eight fluid ounces (346.6 ml) and the contents were again hand-shaken vigorously. The resulting dressing functioned well as a salad dressing when compared to a comparable dressing which contained 113 grams of oil per eight fluid ounces (236.6 ml).

9 The aqueous dispersion of Example 1 was freeze-dried and then ground. Six grams of this material were used in place of the aqueous dispersion. Again an acceptable Italian salad dressing was produced.

10 Six grams of the dry ingredients of the aqueous dispersion of Example 1 were also used in place of the aqueous dispersion. An acceptable Italian salad dressing was produced having a slightly lower viscosity as compared to the dressing which utilized the aqueous dispersion.

11 Thirty grams of a protein-free aqueous dispersion having a 20% solids content (1.91% xanthan gum, 1.91% guar gum, 8.60% oat fiber, 4.29% dextrose and 3.34% maltodextrin) was used in the salad dressing in place of the dispersion of Example 1. The resulting salad dressing was less opaque but was overall comparable to the salad dressing prepared with the dispersion of Example 1.

12 Thirty grams of another protein-free aqueous dispersion having a 20% total solids content (1% xanthan gum, 1% guar gum, 4.52% oat fiber, 9.45% lactose, 2.25% dextrose and 1.76% maltodextrin) wad used in the salad dressing in place of the dispersion of Example 1. The resulting dressing had an appearance and viscosity close to the salad dressing prepared with the dispersion of Example 1.

13 EXAMPLE 4

14 A fat-free, chocolate-flavored frozen dessert having a moisture content of about 56% was prepared as follows:

Ingredient	(Weight %)
Sugar	17.9
Non-Fat Milk Solids	12.7
Polydextrose	4.7
Cocoa	2.5
Salt	0.1
Water	51.3
Aqueous Dispersion (Example 1)	10.5
Flavor	0.3

15 The sugar, milk solids, polydextrose and salt were dry blended to a homogeneous mix. Water was placed in a Stephan.TM. high-speed mixer followed by the aqueous dispersion and then the dry blend. Mixing was continued for about two minutes at high speed until the mixture was free of lumps. The mixture was then heated to 160.degree. F. (71.1.degree. C.) and maintained at this temperature for five minutes with constant stirring. The flavors were then added. The mixture was then frozen in an ice cream freezer which incorporated air to a 100% overrun. The resulting product was smooth, had a creamy mouthfeel and was not gummy.

16 EXAMPLE 5

17 Reduced-fat hamburger patties were prepared and cooked as follows:

Ingredient	(Weight %)
Lean Ground Beef (10% Fat)	98.0
Aqueous Dispersion (Example 1)	2.0

18 The ingredients were blended together in a Hobart.TM. mixing bowl. Patties (about 114 grams) of uniform thickness were prepared using a patty press and the formed patties were frozen. Thereafter, the frozen patties were placed on a pre-heated frying griddle and cooked for about 2.5 minutes on each side. The cooked patties were tender but did not fall apart when handled. The cooked patties had good bite and mouthfeel, were uniformally browned throughout and had good flavor. The overall taste was regarded as comparable to patties made entirely of ground beef containing 20% fat.

19 EXAMPLE 6

20 A fat-free mayonnaise was prepared as follows:

Ingredient	(Amount)	
Aqueous Dispersion (Example 1)	1.4	liters
Vinegar	90	ml.
Lemon Juice	55	ml.
Dry Mustard	4	g.
Lecithin	2	g.
Cayanne	pinch	

21 The aqueous dispersion was placed in a mixer and whipped. 30 ml. of vinegar was added and the mixture was whipped well. The dry ingredients were preblended then added to the mixer and mixed well. While mixing at high speed and as the mix thickens, the remaining vinegar is slowly added to thin out the mixture. The lemon juice was then added to lower the pH of the mixture and mixing was continued at a high speed for 3-4 minutes. The resulting mixture was an acceptable substitute for conventional mayonnaise which contains about 80% fat.

CLAIMS:

We claim:

1. A reduced fat or fat free food product having a moisture content above 45% by weight wherein the reduced fat level is effected by substituting an aqueous dispersion for fat, said dispersion containing polysaccharide hydrocolloid, insoluble fiber and protein at a weight ratio of from 1:0.2-3.5:1.1-4.5 and wherein the dispersion is added to the food product at a level of from 0.05 to 2.0 parts of polysaccharide hydrocolloid per 100 parts of water.

2. The food product of claim 1 wherein fat is replaced by substituting the aqueous dispersion for fat at a weight ratio of 0.5-1.5:1.

3. The food product of claim 1 which is reduced fat hamburger comprising lean ground beef and the aqueous dispersion.

4. The food product of claim 1 wherein the weight ratio of polysaccharide hydrocolloid to insoluble fiber to protein in the aqueous dispersion is 1:0.8-3.0:1.5-3.5.

5. The food product of claim 4 wherein the weight ratio is 1:1.5-2.0:2.0-3.0.

6. The foodstuff of claim 1 wherein the insoluble fiber is present in the foodstuff at a level of from 0.05 to 2.0 parts per 100 parts of water.

7. The foodstuff of claim 1 wherein the moisture content of the foodstuff is above 50%.

8. The food product of claim 1 wherein the food product is essentially fat-free.

9. The food product of claim 1 wherein the polysaccharide hydrocolloid is comprised of anionic gum and galactomannan gum.

10. The food product of claim 9 wherein the ratio of anionic gum to galactomannan gum is from 1:4 to 4:1.

11. The food product of claim 10 wherein the anionic gum contains a carboxylic acid group in its molecular structure.

12. The food product of claim 2 selected from the group consisting of salad dressings, sauces, gravies, meat products, soups, filling and toppings.

13. The food product of claim 1 wherein fat is replaced by substituting the aqueous dispersion for fat at a level of about one part of hydrocolloid for each 40 to 60 parts of fat replaced.

14. The food product of claim 1 wherein the aqueous dispersion has a paste-like consistency and comprises from 5 to 30% solids based on the weight of polysaccharide hydrocolloids, insoluble fiber, protein and water.

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L4: Entry 7 of 11 File: USPT Mar 19, 1996

DOCUMENT-IDENTIFIER: US 5500190 A
TITLE: Anion exchange resin compositions containing almond paste for taste improvement

Brief Summary Text (15):
U.S. Pat. No. 4,871,557 to Linscott, issued Oct. 3, 1989 describes a granola bar containing supplemental dietary fiber. Psyllium is listed as one of many sources of supplemental dietary fiber. Flavoring agents, toasted rolled oats, chopped almonds, and coconut flakes are among many materials mentioned as optional granola ingredients. U.S. Pat. No. 4,619,831, to Sharma, issued Oct. 28, 1986, describes dietary fiber products comprising insoluble dietary fiber (92-98.5%) coated or enrobed with soluble dietary fiber (1.5-8%; psyllium is mentioned as one of many soluble fibers). U.S. Pat. No. 5,009,916, to Kyriopoulos, issued Apr. 23, 1991, describes high fiber food compositions comprising psyllium and other dietary fiber sources.

Brief Summary Text (32):
Colestipol is an insoluble high molecular weight basic anion-exchange copolymer of diethylene triamine and 1-chloro-2,3-expoxypropane with approximately 1 out of 5 amine nitrogens protonated (chloride form). [The Merck Index, 11th edition, published by Merck & Co., No. 2472 (1989), incorporated by reference herein in its entirety]. Colestipol is commercially available as colestipol hydrochloride granules under the trade name Colestid.RTM. (Upjohn).

Brief Summary Text (45):
The present compositions also optionally comprise dietary fiber, preferably psyllium husk fiber as described hereinafter and/or insoluble dietary fiber. The term "insoluble dietary fiber", as used herein, means the water insoluble, substantially non-swellable component of fiber material safe for human ingestion which is non-digestible and non-metabolizable by humans.

Brief Summary Text (46):
A wide range of materials containing insoluble dietary fiber may be used in the present invention. Preferred are cereal brans and mixtures thereof, due to their relatively high content of insoluble dietary fiber. Also preferred is that these cereal brans comprise at least about 75% of the insoluble dietary fiber. Brans preferred include those selected from the group consisting of wheat, corn, barley, rye, oats, rice, soybean, beets, and mixtures thereof. Most preferred are oat or corn. The components of the insoluble dietary fiber from these cereal brans are known to be cellulose, hemicellulose and lignin.

Brief Summary Text (47):
Compositions of the present invention containing insoluble dietary fiber typically comprise from about 1% to about 20% of an insoluble dietary fiber, and preferably from about 5% to about 10% insoluble dietary fiber, by weight of the compositions.

US Reference Patent Number (36):
4871557

US Reference Group (36):
4871557 19891000 Linscott 426/93

09/641882

☐ Generate Collection

L4: Entry 9 of 11 File: USPT Nov 2, 1993

DOCUMENT-IDENTIFIER: US 5258181 A
TITLE: Compositions containing psyllium

Brief Summary Text (4):
U.S. Pat. No. 4,784,861, to Gori, issued Nov. 15, 1988, describes powders formed of a mixture of oat, wheat and corn bran mixed with pectin, guar gum, psyllium and cutin to which mineral supplements have been added. U.S. Pat. No. 4,619,831, to Sharma, issued Oct. 28, 1986, describes dietary fiber products comprising insoluble dietary fiber (92-98.5%) coated or enrobed with soluble dietary fiber (1.5-8%; psyllium is mentioned as one of many soluble fibers). U.S. Pat. No. 4,565,702, to Morley et al., issued Jan. 21, 1986, describes dietary fiber compositions comprising dietary fibers which are insoluble fibers coated with soluble fiber. U.S. Pat. No. 4,348,379, to Kowalsky et al., issued Sep. 7, 1982, describes dietetic compositions comprising psyllium seed, linseed, and wheat bran. European Patent Application Publication No. 144,644, published Jun. 19, 1985 by G. D. Searle and Co., describes high fiber food compositions comprising psyllium and other dietary fiber sources.

Detailed Description Text (19):
The present compositions also optionally comprise other dietary fiber, preferably insoluble dietary fiber. The term "insoluble dietary fiber", as used herein, means the water insoluble, substantially non-swellable component of fiber material safe for human ingestion which is non-digestible and non-metabolizable by humans.

Detailed Description Text (20):
A wide range of materials containing insoluble dietary fiber may be used in the present invention. Preferred are cereal brans and mixtures thereof, due to their relatively high content of insoluble dietary fiber. Also preferred is that these cereal brans comprise at least about 75% of the insoluble dietary fiber. Brans preferred include those selected from the group consisting of wheat, corn, barley, rye, oats, rice, soybean, beets, and mixtures thereof. Most preferred are oat, wheat, or corn. The components of the insoluble dietary fiber from these cereal brans are known to be cellulose, hemicellulose and lignin.

Detailed Description Text (21):
Compositions of the present invention containing insoluble dietary fiber typically comprise from about 1% to about 20% of an insoluble dietary fiber, and preferably from about 5% to about 10% insoluble dietary fiber, by weight of the compositions.

US Reference Patent Number (28):
4871557

US Reference Group (28):
4871557 19891000 Linscott 426/93